S8428-1

STATE OF WASHINGTON

DATA SUMMARY & ANALYSIS
OF
1983 TRAFFIC COLLISIONS

Prepared By:

Ken Thompson, Data Analyst
Washington Traffic Safety Commission

II — OVERALL STATEWIDE PROBLEM ANALYSIS

List of Statistical Tables and Charts

Page

Statewide Summary

Impact and Exposure Rates II-1
Fatalities by Status II-2
Traffic Deaths, Travel, Death Rate, Reported Collisions & Injuries II-3
Multiple, Single, Vehicle-Pedestrian, and Vehicle Pedalcycle Collisions II-4
Traffic Deaths and Death Rates by County II-5
Highways Travel and Traffic Fatalities—1983 .... II-6
Traffic Fatalities in 1983 and Percent Change from 1982 .... II-7
Traffic Fatalities by Age and Sex 1983 .... II-7
Traffic Collision Problem Areas by County Priority II-8
Collision Rates by County Population II-9
Collision Rates by City Population II-10

Explanation of Problem Analysis Process II-11

Impact Problems

Alcohol Involvement II-14
Youth Involvement II-27
Safety Restraint Usage II-32
Motorcycle Collisions II-40
Pedalcycle II-47
Pedestrians II-50
Heavy Trucks II-54
Pupil Transportation II-58
Contributory Driver Violations II-59
Vehicle Defects II-60

STATEWIDE SUMMARY

Overview

In 1983 there were 106,597 total reported collisions. This figure represents a 2.0% decrease in collisions compared to the 1980-1982 three year baseline period. In 1983, 705 persons were killed in 635 fatal collisions. These figures represent a drop of 19.1% in the number of persons killed and a 18.2% drop in the number of fatal collisions compared to the baseline. There were 40,273 injury collisions, injuring a total of 58,317 persons, in 1983. Those figures represent a 0.9% drop in injury collisions and a 1.4% drop in the number of persons injured. The 65,689 property damage accidents represented a decrease of 2.5% compared to the 3 year baseline period (Table 1-1).

Table 1-1

IMPACT	Years				Prev. 3 Yr. Average (80-82)	% of Change '83 - 3 Yr. Average
	1983	1982	1981	1980		
Total Collisions	106,597	100,644	111,993	113,751	108,796	- 2.0%
Fatal Collisions	635	679	790	860	776	- 18.2%
Total Killed	705	757	872	984	871	- 19.1%
Injury Collisions	40,273	37,790	41,947	42,139	40,625	- 0.9%
Total Injured	58,317	54,789	61,083	61,532	59,135	- 1.4%
Property Damage Only Collisions	65,689	62,175	69,256	70,752	67,394	- 2.5%

Exposure

Motor vehicle travel was up 8.3% in 1983 over the 1980-82 baseline period. Motor vehicle registrations were up 1.0%. The number of licensed drivers increased 5.3% over the baseline period. The state's population increased 1.8%, to 4,285,100 (Table 1-2).

Table 1-2

EXPOSURE	Years				Prev. 3 Yr. Average (1980-1982)	% of Change 1983 to prior 3 yr. Average
	1983	1982	1981	1980		
**Motor Vehicle Travel	32,275.0	30,353.0	30,346.0	28,696.0	29,798.0	+ 8.3%
Motor Vehicle Registration	3,372,966	3,313,348	3,408,871	3,293,019	3,338,413	+ 1.0%
Licensed Drivers	2,867,032	2,774,212	2,732,722	2,662,659	2,723,198	+ 5.3%
State's Population	4,285,100	4,264,000	4,248,100	4,109,853	4,207,318	+ 1.8%

**In Millions

Rates

The 1983 motor vehicle traffic death rate decreased to 2.18 deaths per 100 million vehicle miles of travel. This was a decrease of 25.3% compared to the baseline average. The injury rate of 1.81 injuries per one million vehicle miles represented a 8.6% decrease over the baseline (Table 1-3).

Table 1-3

RATES	Years				Prev. 3 Yr. Average (1980-1982)	% of Change 1983 to prior 3 yr. Average
	1983	1982	1981	1980		
Death Rate (Deaths per 100M vehicle miles)	2.18	2.49	2.87	3.43	2.92	- 25.3%
Injury Rate (Injury per 1M vehicle miles)	1.81	1.81	2.01	2.14	1.98	- 8.6%

Fatalities by Status

Driver was the most common status of those who were fatally injured in motor vehicle collisions. This classification was attributed to 343 persons or 48.7% of those who died in 1983. This figure is down 16.1% from the 1980-82 3-year average. Motorcycle passengers represented the greatest percentage decrease, 57.9% over the baseline average. Motorcycle drivers were down 23.4% compared to the baseline (Table 1-4).

Table 1-4

	Years				Prev. 3 Yr. Average (1980-1982)	% of Change '83 - 3 Yr. Average
Status	**1983**	**1982**	**1981**	**1980**		
Drivers (does not include motorcyclists)	343	354	416	458	409	- 16.1%
Passengers	182	186	214	287	229	- 20.5%
Pedestrians	89	101	121	108	110	- 19.1%
Bicyclists	14	8	20	11	13	- 7.7%
Motorcycle Drivers	72	92	88	101	94	- 23.4%
Motorcycle Passengers	5	16	13	19	16	- 57.9%
Totals	705	757	872	984	871	- 19.1%

Traffic Collisions, Deaths, Injuries, Travel and Death Rate

After peaking at 1,034 traffic deaths in 1979, a downward trend started in 1980 and has continued through 1983. The 705 deaths recorded in 1983 was down 6.9% compared to 1982, and down 31.8% from the all time high recorded in 1979 (Figure 1-1). Motor Vehicle Travel, by contrast, has experienced a steady increase over the ten year period, with the exceptions of 1979 and 1980 when travel dropped slightly due to the sharp increase in the price of gasoline. 1983 recorded a high of 32.28 billion miles, up 6.3% over 1982 (Figure 1-2).

Washington's death rate of 2.18 deaths per 100 million vehicle miles of travel was once again the lowest in the state's history and down 12.4% from the 2.49 rate for 1982. Washington's death rate continued below the national death rate for the fourth consecutive year (Figure 1-3). Total reported collisions and injuries increased in 1983 after a sharp drop in 1982. However, the 106,597 collisions reported in 1983 was down 4.2% compared to the previous four year average. Likewise the 58,317 injuries reported last year was down 3.9% compared to the previous four year average (Figure 1-4).

Collisions by Type

Multiple vehicle collisions recorded a sharp increase (+7.8%) in 1983 over 1982. However, in comparing 1983 with the previous four year average, 1983 recorded a 3.5% reduction, so the slope has steadily decreased since 1975 (Figure 1-5). Single vehicle collisions continued a downward trend which was started in 1977 (Figure 1-6). Vehicle pedestrian collisions leveled off after experiencing a four year downward trend after four years of increases—1975 to 1978 (Figure 1-7). Vehicle -Pedalcyclist collisions experienced a sharp increase in 1983 recording 1,230 crashes, up 16.5% over 1982. For the ten year period vehicle-pedalcyclist collisions had experienced a fairly stable rate from a high peak in 1974 to a low in 1978 (Figure 1-8).

Traffic Deaths and Death Rates by County

In 1983 fatalities ranged from a high of 143 in King County, with a death rate of 1.5 (traffic deaths per 100 million vehicle miles of travel) to a low of zero deaths in Pacific County. San Juan County recorded the highest death rate, at 11.9, computed on two fatalities, followed by Ferry County which recorded a 10.9 death rate on six deaths.

Highways, Travel and Fatalities

In 1983, the interstate system was again the most traveled road system in the state, recording 8.053 billion miles up 6.6% from the 7.553 billion miles recorded in 1982. It also had the lowest death rate in the state at 0.92 based on 74 fatalities. This is down from the 1.10 rate of a year ago, and the lowest rate since 1978 when a rate of 0.91 was recorded.

In contrast, the county roads were traveled 6.368 billion miles and recorded a death rate of 3.99. Two hundred fifty-four (254) persons were killed on the county road system. County roads recorded an increase in the number of traffic deaths, 238 to 254 in 1983, a 6.7% increase and consequently an increase in the death rate from 3.94 in 1982 to 3.99 rate in 1983. Traffic deaths on city streets decreased by 5 for a decrease in the death rate, from 1.67 in 1982 to 1.51 in 1983. The death rate on the U.S. numbered routes were reduced substantially in 1983 recording 51 deaths, compared to 96 deaths in 1982, a reduction of 46.9%. In 1982 the death rate was 3.71 compared to 1.86 in 1983. Motor vehicle travel increased from 2.590 billion miles to 2.747 billion miles (Table 1-5).

Figure 1-1

TRAFFIC DEATHS 1974-1983

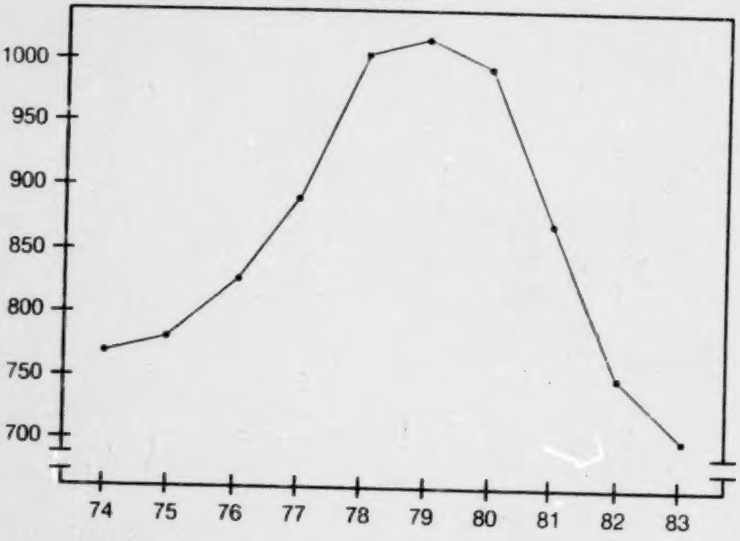


Figure 1-2

MILES TRAVELED (in billions)

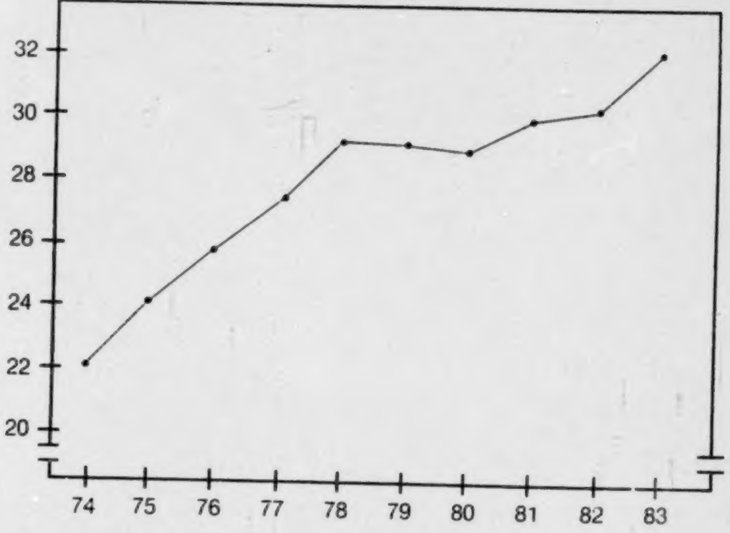


Figure 1-3
DEATH RATE
(per 100 million vehicle miles)

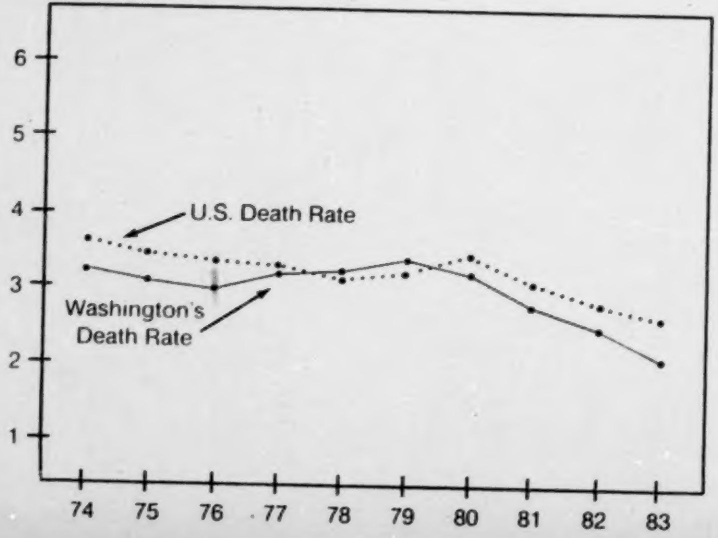


Figure 1-4
TOTAL REPORTED MOTOR VEHICLE TRAFFIC
COLLISIONS AND INJURIES (in thousands)

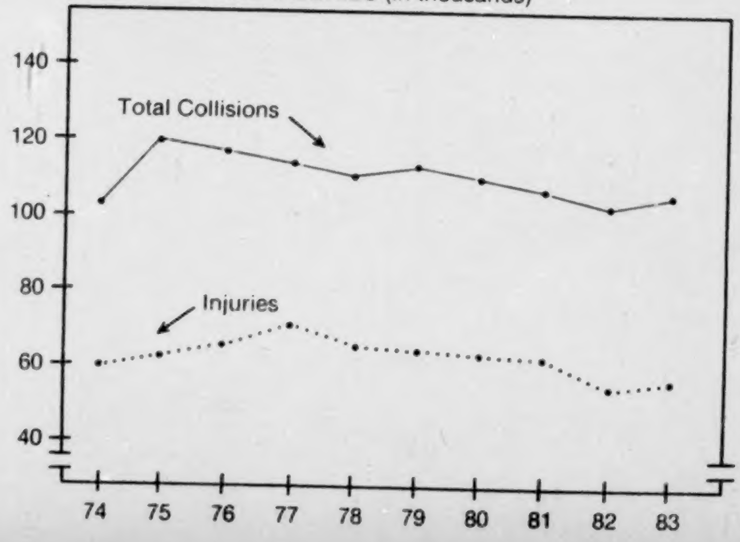


Figure 1-5
MULTIPLE VEHICLE COLLISIONS
(in thousands)

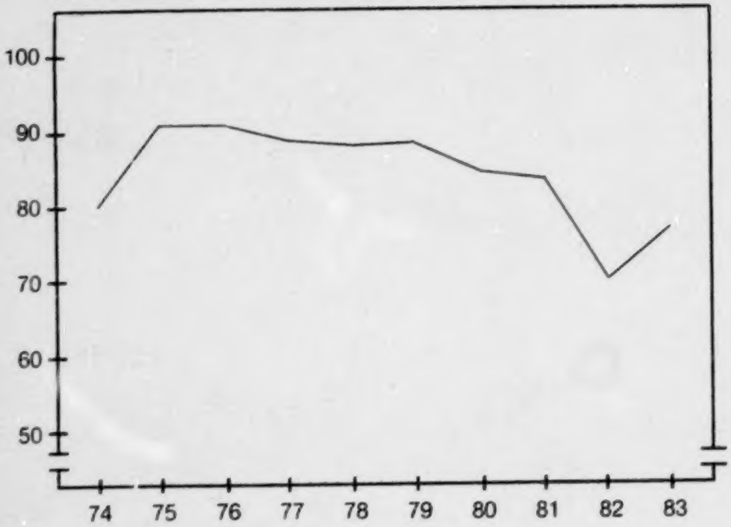


Figure 1-6
SINGLE VEHICLE COLLISIONS
(in thousands)

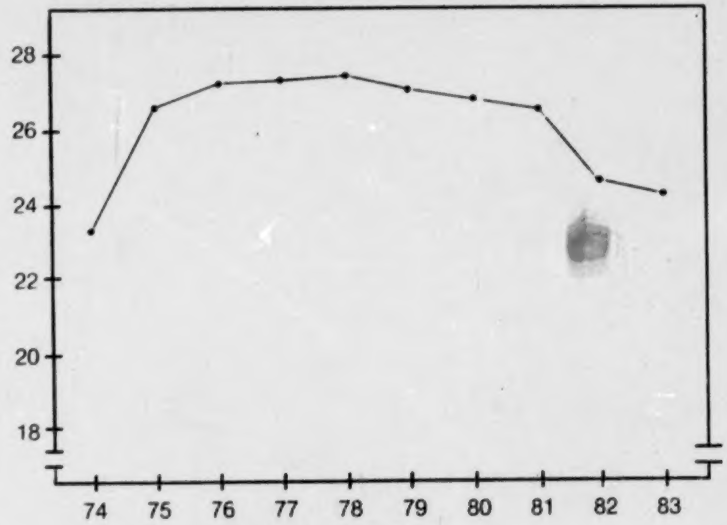


Figure 1-7
VEHICLE-PEDESTRIAN COLLISIONS
(in hundreds)

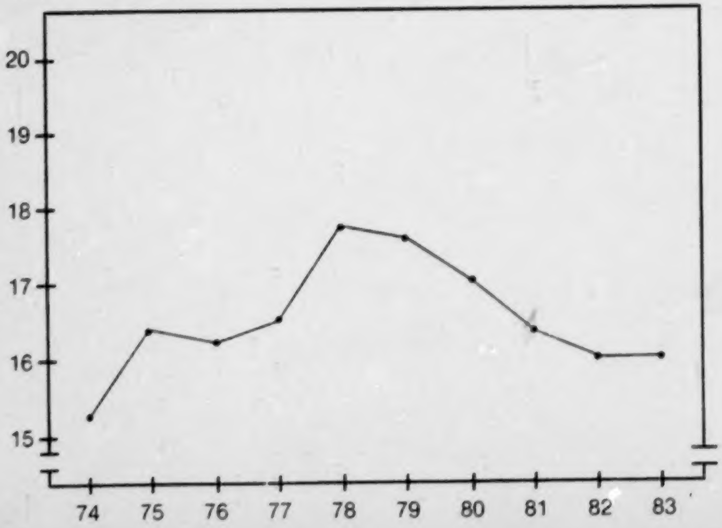
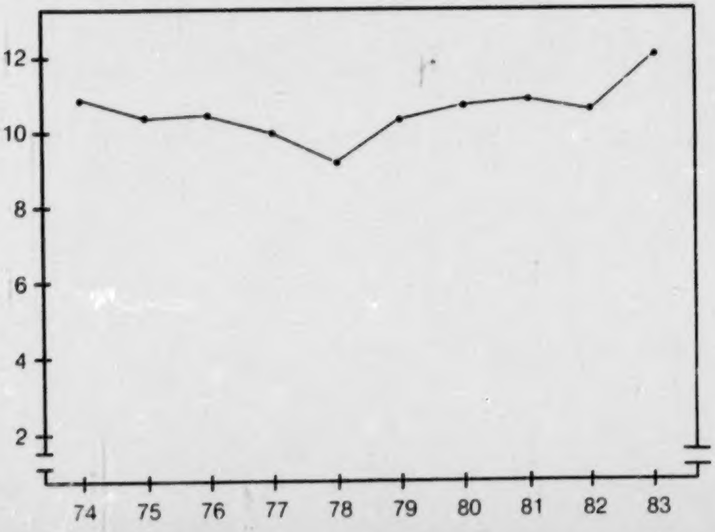
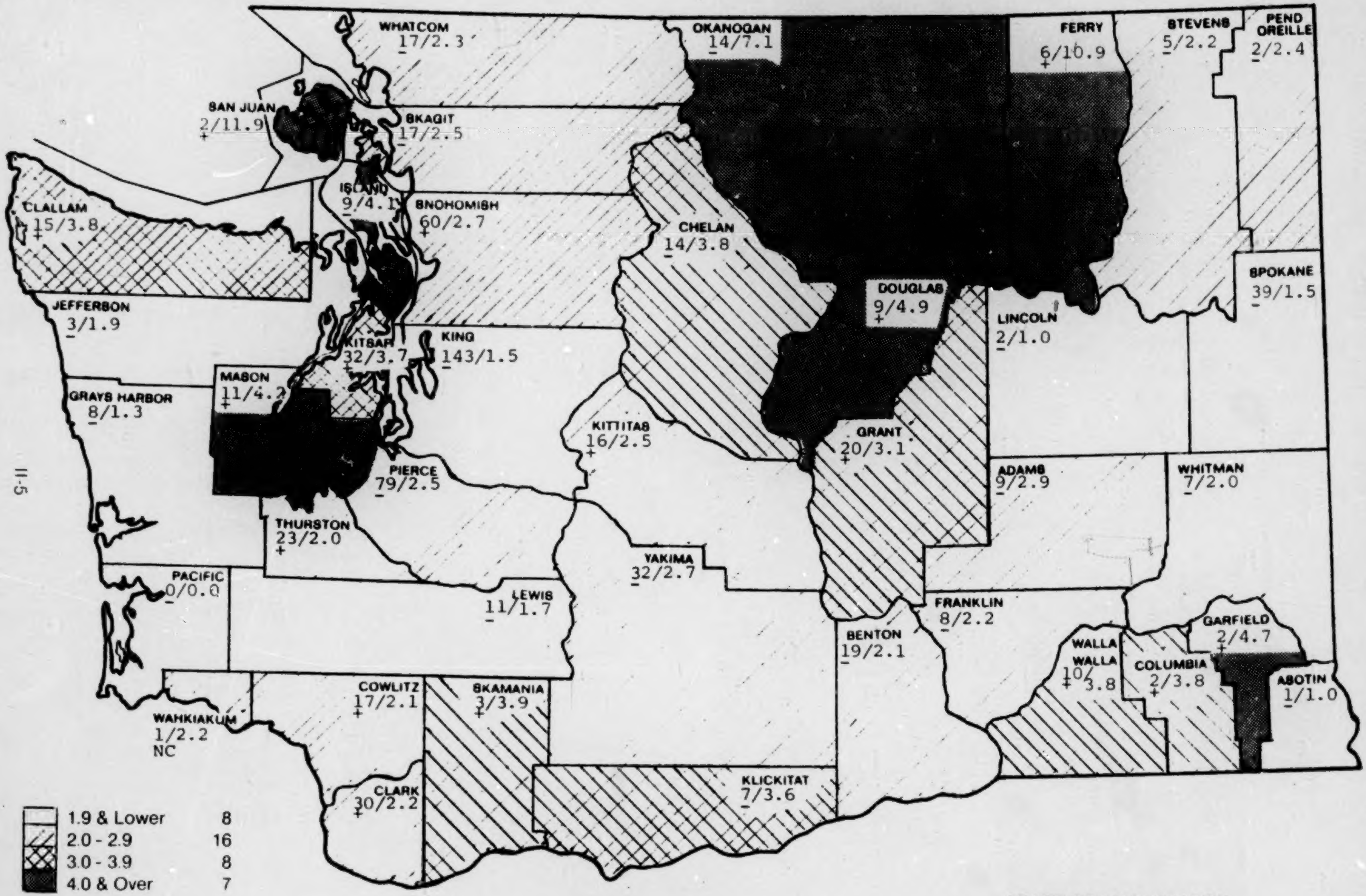


Figure 1-8
VEHICLE-PEDALCYCLIST COLLISIONS
(in hundreds)




WHATCOM
17/2.3
−
OKANOGAN
14/7.1
−
FERRY
6/10.9
+
STEVENS
5/2.2
−
PEND OREILLE
2/2.4
−
SAN JUAN
2/11.9
+
SKAGIT
17/2.5
−
CLALLAM
15/3.8
+
ISLAND
9/4.1
SNOHOMISH
60/2.7
+
CHELAN
14/3.8
−
SPOKANE
39/1.5
−
JEFFERSON
3/1.9
−
DOUGLAS
9/4.9
+
LINCOLN
2/1.0
−
KITSAP
32/3.7
+
KING
143/1.5
−
MASON
11/4.2
+
GRAYS HARBOR
8/1.3
−
KITTITAS
16/2.5
+
GRANT
20/3.1
+
PIERCE
79/2.5
−
ADAMS
9/2.9
−
WHITMAN
7/2.0
−
THURSTON
23/2.0
+
YAKIMA
32/2.7
−
PACIFIC
0/0.0
−
LEWIS
11/1.7
−
FRANKLIN
8/2.2
−
BENTON
19/2.1
−
GARFIELD
2/4.7
+
WALLA WALLA
10/3.8
+
COLUMBIA
2/3.8
+
ASOTIN
1/1.0
−
COWLITZ
17/2.1
+
SKAMANIA
3/3.9
+
WAHKIAKUM
1/2.2
NC
CLARK
30/2.2
+
KLICKITAT
7/3.6
−
1.9 & Lower 8
2.0 - 2.9 16
3.0 - 3.9 8
4.0 & Over 7

Traffic Deaths/Death Rate
705/2.2
- = **Less Than 1982**
+ = **More Than 1982**

STATE OF WASHINGTON
TRAFFIC DEATHS & DEATH RATE
By County — 1983
Statewide Death Rate 2.2

Table 1-5 HIGHWAYS, TRAVEL AND FATAL ACCIDENTS — 1983

Type of Highways	Miles of Highway	Percent of Total Highways	Veh. Miles Traveled (Millions)	Percent of Total Veh. Mi. Traveled	Total Collisions	Number Killed	*Death Rate Per CMVM
Interstate System**	697	.82	8,053	24.95	8,267	74	0.92
U.S. Numbered Routes	1,592	1.88	2,747	8.51	3,890	51	1.86
State Numbered Routes	4,653	5.49	7,339	22.74	16,827	197	2.68
County Roads	41,351	48.79	6,368	19.73	24,168	254	3.99
City Streets	10,110	11.93	7,697	23.85	52,684	116	1.51
All Other Traffic Ways	26,349	31.09	71	.22	761	13	—
TOTAL	84,752	100.00	32,275	100.00	106,597	705	2.18

*Fatalities per hundred million vehicle miles, based on roadway travel as reported by the Department of Transportation.
**Does not include traveled way.

Figure 1-10

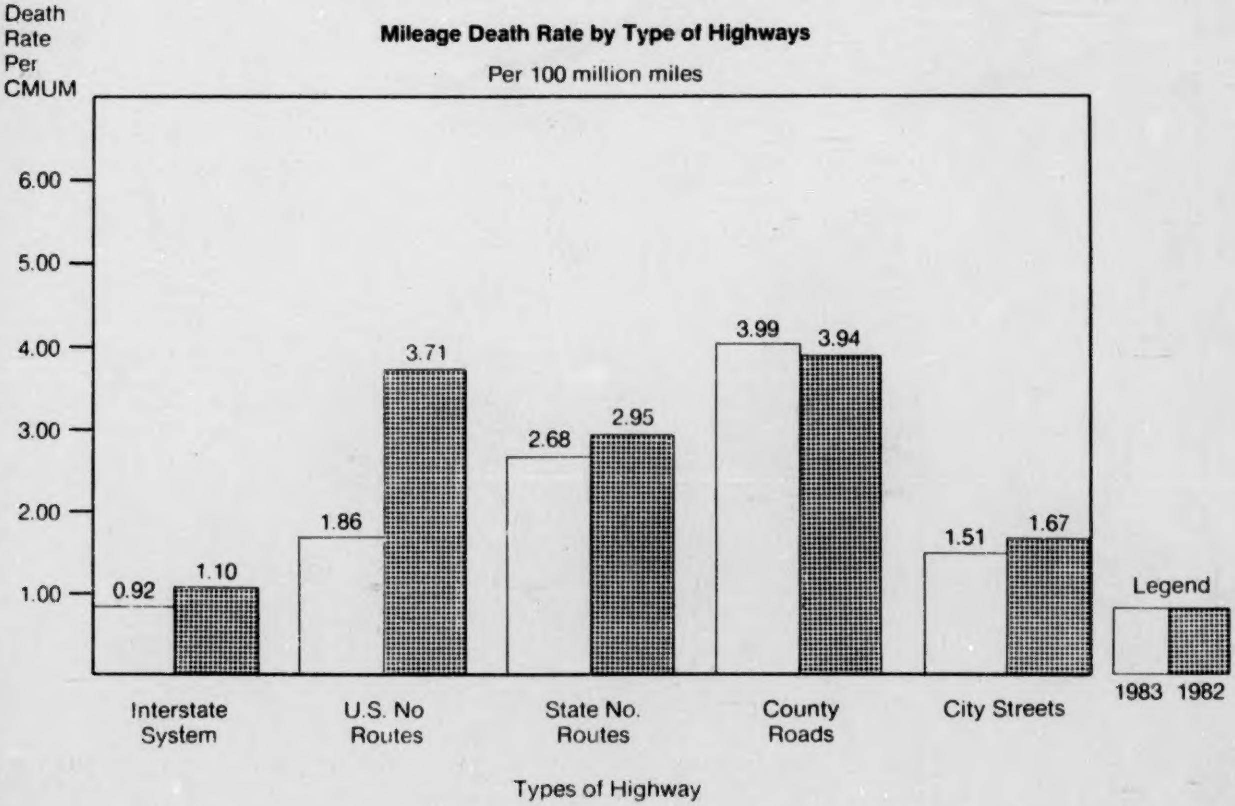


Figure 1-11

Traffic Fatalities in 1983 and Percent Change from 1982

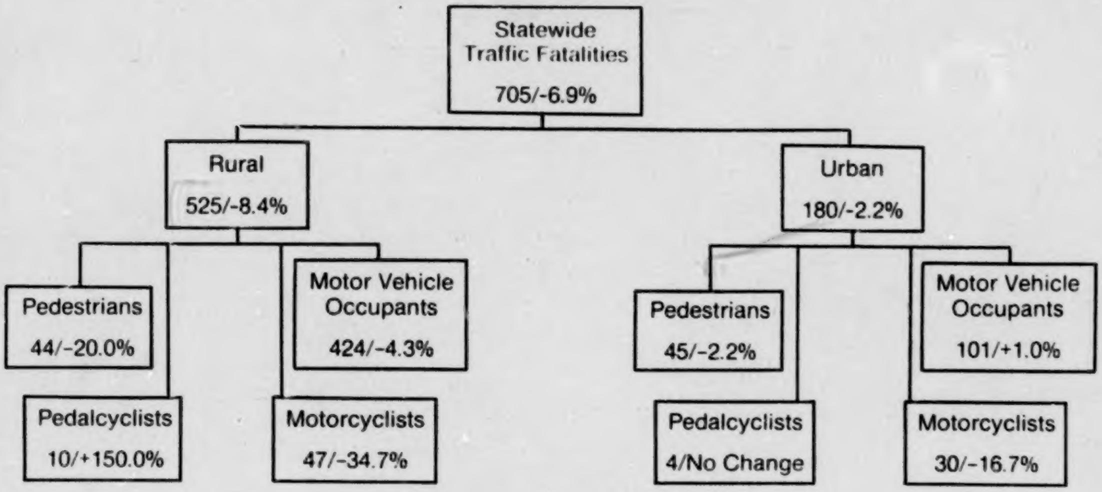

Statewide Traffic Fatalities 705/-6.9%
Rural 525/-8.4%
Urban 180/-2.2%
Pedestrians 44/-20.0%
Motor Vehicle Occupants 424/-4.3%
Pedalcyclists 10/+150.0%
Motorcyclists 47/-34.7%
Pedestrians 45/-2.2%
Motor Vehicle Occupants 101/+1.0%
Pedalcyclists 4/No Change
Motorcyclists 30/-16.7%

Figure 1-12

Traffic Fatalities by Age and Sex

1983

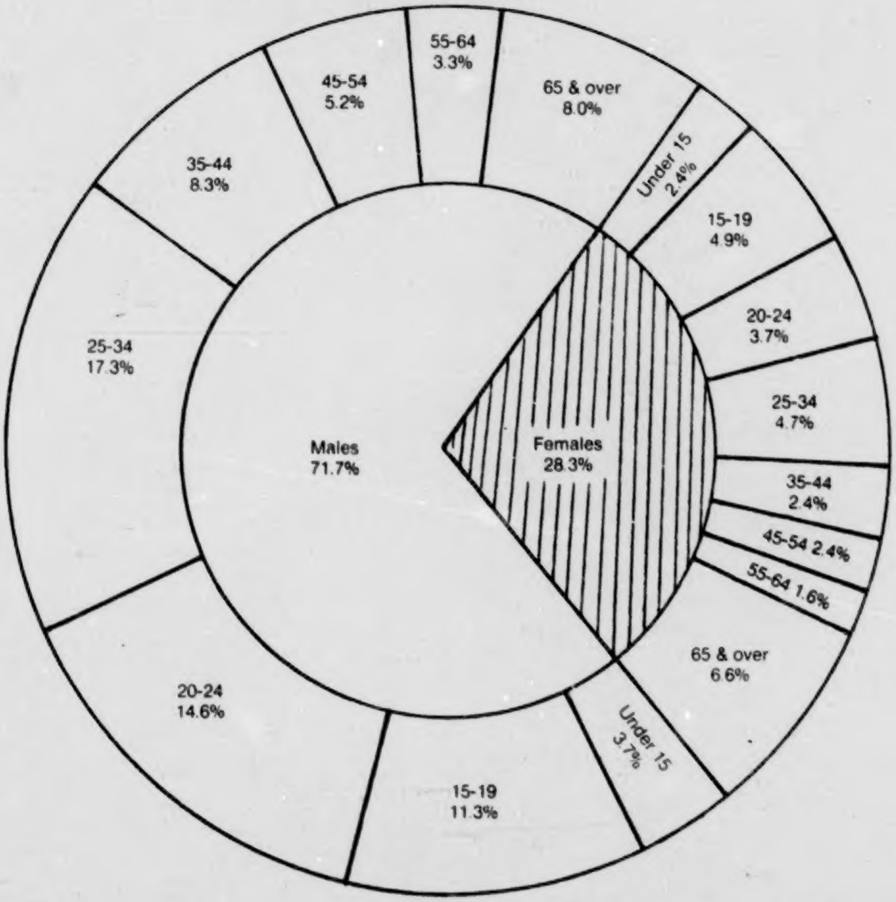


Table 1-6

Traffic Collision Problem Area by County Priority
1983

Rank	Total Collision	Drinking Driver Collisions	Collisions Involving Youthful Drivers
	King	Pierce	Pierce
2	Pierce	Snohomish	King
3	Snohomish	Kitsap	Snohomish
4	Kitsap	Yakima	Kitsap
5	Yakima	Okanogan	Yakima
6	Spokane	King	Clark
7	Clark	Grays Harbor	Spokane
8	Whatcom	Whatcom	Whatcom
9	Chelan	San Juan	Walla Walla
10	Walla Walla	Mason	Thurston
11	Benton	Walla Walla	Benton
12	Thurston	Chelan	Chelan
13	Okanogan	Island	Cowlitz
14	Grays Harbor	Clark	Grays Harbor
15	Island	Spokane	Island
16	Clallam	Benton	Skagit
17	Skamania	Skagit	Okanogan
18	San Juan	Thurston	San Juan
19	Cowlitz	Stevens	Franklin
20	Franklin	Ferry	Lewis
21	Skagit	Clallam	Clallam
22	Lewis	Asotin	Mason
23	Mason	Lewis	Whitman
24	Asotin	Pacific	Asotin
25	Douglas	Cowlitz	Douglas
26	Ferry	Franklin	Grant
27	Pacific	Pend Oreille	Stevens
28	Stevens	Skamania	Pacific
29	Jefferson	Grant	Kittitas
30	Grant	Douglas	Columbia
31	Whitman	Whitman	Pend Oreille
32	Kittitas	Kittitas	Klickitat
33	Klickitat	Klickitat	Skamania
34	Pend Oreille	Jefferson	Adams
35	Columbia	Wahkiakum	Wahkiakum
36	Adams	Garfield	Jefferson
37	Garfield	Columbia	Ferry
38	Lincoln	Adams	Garfield
39	Wahkiakum	Lincoln	Lincoln

FOOTNOTE: The counties are ranked from 1 to 39 for total countywide experience for: collisions on all roadways; drinking driver collisions and youthful driver collisions. Total collisions, miles of roadway and travel were considered for each county in the ranking. Number 1 indicates the worst problem and 39 the least.

Table 1-7

Collision Rates By County Population — 1983

County	1983 Population	Traffic Deaths	Death Rate*	No. of Injuries	Injury Rate**	Total Collisions	Collision Rate**
Over 1,000,000 Population							
1. King	1,315,800	143	10.87	19,863	15.10	38,533	29.28
250,000 to 500,000 Population							
1. Pierce	507,000	79	15.58	7,610	15.01	13,335	26.30
2. Snohomish	360,000	60	16.67	4,626	12.85	8,100	22.50
3. Spokane	348,000	39	11.21	4,938	14.19	8,031	23.08
100,000 to 250,000 Population							
1. Clark	200,000	30	15.00	2,430	12.15	4,135	20.68
2. Yakima	177,000	32	18.08	1,980	11.19	4,057	22.92
3. Kitsap	161,600	32	19.80	1,835	11.36	3,394	21.00
4. Thurston	133,500	23	17.23	1,707	12.79	3,124	23.40
5. Whatcom	112,100	17	15.17	1,445	12.89	2,366	21.11
6. Benton	108,700	19	17.48	1,265	11.64	2,482	22.83
50,000 to 100,000 Population							
1. Cowlitz	79,300	17	21.44	1,040	13.11	1,890	23.83
2. Skagit	66,100	17	25.72	1,022	15.46	1,669	25.25
3. Grays Harbor	65,800	8	12.16	831	12.63	1,615	24.54
4. Lewis	56,000	11	19.64	805	14.38	1,377	24.59
5. Clallam	52,200	15	28.74	520	9.96	1,074	20.57
25,000 to 50,000 Population							
1. Grant	49,100	20	40.73	550	11.20	964	19.63
2. Walla Walla	48,200	10	20.75	569	11.80	942	19.54
3. Island	47,000	9	19.15	416	8.85	696	14.81
4. Chelan	46,500	14	30.11	583	12.54	1,247	26.82
5. Whitman	38,900	7	17.99	376	9.67	641	16.48
6. Franklin	36,000	8	22.22	410	11.39	923	25.64
7. Mason	33,600	11	32.74	438	13.04	692	20.60
8. Okanogan	31,500	14	44.44	356	11.30	710	22.54
9. Stevens	29,700	5	16.84	324	10.91	503	16.94
10,000 to 25,000 Population							
1. Kittitas	24,900	16	64.26	473	19.00	922	37.03
2. Douglas	22,400	9	40.18	249	11.12	439	19.60
3. Pacific	17,600	0	—	225	12.78	402	22.84
4. Asotin	16,800	1	5.95	116	6.90	271	16.13
5. Jefferson	16,800	3	17.86	194	11.55	362	21.55
6. Klickitat	16,300	7	42.94	170	10.43	313	19.20
7. Adams	13,600	9	66.18	223	16.40	319	23.46
Under 10,000 Population							
1. Lincoln	9,600	0	—	128	13.33	169	17.60
2. Pend Oreille	8,900	2	22.47	118	13.26	163	18.31
3. San Juan	8,700	2	22.99	73	8.39	122	14.02
4. Skamania	7,800	3	38.46	127	16.28	202	25.90
5. Ferry	6,100	6	98.36	102	16.72	152	24.92
6. Columbia	4,000	2	50.00	76	19.00	109	27.25
7. Wahkiakum	3,700	1	27.03	44	11.89	77	20.81
8. Garfield	2,400	2	83.33	60	25.00	75	31.25
Total	4,285,100	705	16.45	58,317	13.61	106,597	24.88

*Frequency per 100,000 Population
**Frequency per 1,000 Population

Collision Rate By City Population — 1983
Cities 10,000 Population and Greater

(Does not include collisions on state limited access roads or freeways)

City	1983 Population	Traffic Deaths	Death Rate*	No. of Injuries	Injury Rate**	Total Collisions	Collision Rate**
250,000 and over Population							
1. Seattle	489,700	46	9.4	8,128	16.60	17,091	34.90
100,000 to 250,000 Population							
1. Spokane	170,200	9	5.3	2,924	17.18	5,095	29.94
2. Tacoma	158,400	16	10.1	2,956	18.66	5,725	36.14
50,000 to 100,000 Population							
1. Bellevue	73,900	2	2.7	1,027	13.90	2,059	27.86
2. Everett	56,200	1	1.8	762	13.56	1,956	34.80
25,000 to 50,000 Population							
1. Yakima	48,500	3	6.2	758	15.63	1,819	37.51
2. Bellingham	45,900	0	—	531	11.57	1,092	23.79
3. Vancouver	42,600	6	14.1	693	16.27	1,388	32.58
4. Kennewick	35,700	3	8.4	353	9.89	904	25.32
5. Bremerton	35,475	7	19.7	536	15.11	1,225	34.53
6. Renton	32,700	4	12.2	983	30.06	1,248	38.17
7. Richland	32,000	5	15.6	383	11.97	734	22.94
8. Longview	30,100	4	13.3	454	14.95	847	28.14
9. Auburn	29,000	4	13.8	339	11.69	703	24.24
10. Olympia	28,000	5	17.9	460	16.43	1,008	36.00
11. Edmonds	27,000	1	3.7	218	8.07	483	17.89
12. Redmond	26,300	0	—	274	10.42	491	18.67
13. Walla Walla	25,600	2	7.8	264	10.31	520	20.31
14. Kent	25,500	2	7.8	665	26.08	1,141	44.71
15,000 to 25,000 Population							
1. Lynnwood	23,000	0	—	483	21.00	898	39.04
2. Pullman	23,000	0	—	118	5.13	241	10.48
3. Mercer Island	21,150	0	—	82	3.88	219	10.35
4. Pasco	19,050	3	15.7	237	12.44	610	32.02
5. Kirkland	18,850	3	15.9	195	10.34	483	25.62
6. Puyallup	18,550	1	5.4	225	12.13	509	27.44
7. Aberdeen	18,050	4	22.2	200	11.08	562	31.14
8. Wenatchee	17,150	1	5.8	214	12.48	590	34.40
9 Port Angeles	17,100	0	—	165	9.65	458	26.78
10. Montlake Terrace	16,000	0	—	111	6.94	280	17.50
10,000 to 15,000 Population							
1. Lacey	14,300	0	—	146	10.21	324	22.66
2. Mount Vernon	13,600	1	7.4	210	15.44	403	29.63
3. Oak Harbor	12,150	0	—	71	5.84	144	11.85
4. Centralia	11,700	2	17.1	178	15.21	343	29.32
5. Ellensburg	11,550	0	—	58	5.02	209	18.10
6. Kelso	11,000	1	9.1	149	13.55	351	31.91
7. Moses Lake	10,300	0	—	95	9.22	248	24.08
8. DesMoines	10,250	2	19.5	143	13.95	204	19.90
Statewide urban (Less Urban freeways)	2,141,838	151	7.1	27,488	12.83	56,976	26.60

*Frequency per 100,000 population

**Frequency per 1,000 population

EXPLANATION OF PROBLEM ANALYSIS PROCESS

Explanation of Problem Analysis Process

In developing the Problem Identification section for the 1985 Highway Safety Plan (HSP), problem areas were classified into two basic types: impact problems and system support problems.

Impact problems are those whose factors contribute directly to the occurrence of accidents, fatalities and/or injuries and may be corrected through the implementation of countermeasures designed to reduce the effects of these factors.

System support problems are those deficiencies within vital traffic safety programs whose correction may not be directly reflected in a reduction in traffic accidents, injuries or fatalities.

The basis for impact and system support problem identification, analysis and selection for inclusion to the HSP was done in two ways.

1. Impact problem areas were based on identifying statewide experience in impact areas (where information was available) outlined in the Federal safety standards. Various statewide automated and manual traffic information systems were inventoried and analyzed. The data sources included: Traffic Accident Records, Fatal Accident Reporting System, Driver's Licensing Records, Vehicle Registration Records and Highway/Roadway Information. In most instances, four years worth of data were gathered as a baseline to serve as a point of comparison to the current year's activity level.
2. The second source for problem identification inclusion to the HSP resulted from analysis by and for various state and local agencies with an interest in highway safety. The Washington Traffic Safety Commission made it known that the two main emphasis areas in FY 1985 were the non-use of occupant restraint systems, and alcohol-related crashes.

Data Analysis and Statistical Techniques

Data analysis was a key factor in the identification and selection of the traffic problem areas included in this Plan. The analyses were performed to ensure that the conclusions drawn from the data were valid and credible.

The most common data sources in the HSP were the statewide traffic accident records, which were used for identifying the specific traffic problem areas. Four continuous years (1979-1982) of crash experience were used to serve as a baseline in analyzing traffic accident data. This baseline was used to obtain a better perspective to assess the current year's (1983) experience with traffic problem areas. The baseline also serves to negate short-term changes in crash patterns.

The development of over/under-representation ratios were the most frequently used methods of analysis. Where relevant exposure data were available, the generation of over-representation ratios allow for the comparisons of different subgroups relative to the percentage of the population they comprise. Additionally, county and city rankings were generated for different problem areas to compare geographical and political subdivisions.

National Priority Program areas in which no Federal 402 funds are programmed during FY 1985:

Traffic Records

With the advent of the personal computer (mini or microcomputer) several local engineering and police departments in Washington State are generating local traffic enforcement data. It is hoped, however, that the collision reports will continue to be forwarded and processed in a uniform manner at the Accident Records Section of the Washington State Patrol. The manner in which collisions are reported requires that a single repository of collision reports be maintained in order to match and prepare a single file from all investigated and individual driver's reports. The single repository also eliminates a duplication of effort of the various departments. Accident data is available on tape which can be downloaded into floppy disks for local processing.

Efforts are underway to study the possibilities of a consolidated accident records unit at the state level. Several independent departmental studies have been carried out this past year with a goal of reducing redundancies and duplication. Motivation for this action is varied. One of the foremost reasons is to streamline the system in order to generate data at a faster turn around time. The other is to cut the cost of processing the data by the elimination of duplication of effort thus cutting the number of positions at the various state agencies.

While the conclusions and recommendations of the "Accident Data Improvement Plan" (ADIP) was not critical of Washington's Traffic Record System, it did encourage the state to systematize its records system to the extent that various agencies would have the ability to access each other's traffic data. This will continue to be a goal of the state's traffic records community. The ultimate goal will enable state and local jurisdictions to access the state's data from which collision, roadway, and licensing data would be available on a cost payment basis.

Emergency Medical Services

During the last decade, considerable improvements have been made in emergency medical services. In addition to herculean efforts by a host of dedicated individuals several events have taken place that have assisted in bringing emergency medical services to its current level. A brief review of those events is as follows:

A. The National Highway Safety Act of 1966 authorized the Department of Transportation to provide funds for ambulances, communications, training programs, and statewide planning. The state of Washington was a major recipient of Highway Traffic Safety funds which led to substantial improvement in basic life support systems, specifically training and communications.

B. In 1971 the Washington State Legislature included paramedic certification as part of RCW 18.71. The Local Health Officer or the University of Washington were empowered to certify paramedic personnel. In 1973, the Legislature developed new legislation on emergency medical services that sought to establish a minimum baseline for patient care. The legislation was RCW 18.73, providing for the inspection and licensing of pre-hospital emergency medical services. In 1978, RCW 18.71 was revised to include the Department of Social and Health Services and the University of Washington as the certifying agencies of paramedic personnel. It also established varying levels of advanced life support personnel (I.V. Technicians, Airway Technicians, and Paramedics) with specific educational requirements for each category. In 1979, RCW 18.73 was revised to include regional emergency medical services councils as a key ingredient in the state planning process. In addition, the revision attempted a more comprehensive and refined presentation of the requirements for emergency medical services systems development and funding. In 1983 the Legislature again took action to revise and update EMS legislation. This time they included the provision for First Responders, Medical Program Directors and local EMS councils. To some degree these features existed but without specific definition and consistency. Furthermore, physicians who become Medical Program Directors are now able to seek and obtain legal counsel from the state Attorney General while functioning as an agent for the state on administrative EMS matters.

C. In November of 1973, Public Law 93-154, otherwise known as the Emergency Medical Services Act of 1973, was signed into law. Initially, $170 million was authorized over three years. Congress later extended the legislation through 1979, authorizing $200 million for systems development, $15 million for research, $30 million for training and $22.5 million for burn injuries. The state of Washington received in excess of $4 million from 1974 to 1979 in HEW funding. The funds were directed toward the establishment of a statewide emergency medical services system.

D. The 1979 federal funding of emergency medical services systems terminated. The state of Washington enacted Substitute Senate Bill 2305, which later became Amended RCW 18.73, provides the state program with funding and guidelines to continue emergency medical services systems development and improvement.

In summary, the law provides that the Department of Social and Health Services will perform the following:

A. Systems development and coordination, provided by state regional coordinators.

  1. Prescribe minimum requirements for:
     a. ambulances
     b. aid vehicles
     c. communications equipment
     d. personnel engaged in prehospital emergency medical services, specifically, advanced life support and basic life support training.
  2. Establish standards for the operation of emergency medical services systems.
  3. Develop procedures for evaluating system effectiveness.
  4. Coordination of medical air evacuation.
  5. Conduct regional planning of emergency medical services systems, initiated at the local or county level.

B. Distributing approximately $2.5 million in state funds for:

  1. Establishment and initial operation of the emergency medical services program.
  2. Expansion and improvement of emergency medical services programs.
  3. Purchasing vehicles and equipment in support of the initial operation, expansion or improvement.
  4. Training and continuing education.

The future of emergency medical services in Washington State can best be described in specific objectives:

A. Implementation of statewide patient treatment, triage, and transfer protocols.

B. Eighty percent of the state's population covered by a single access (9-1-1) and central dispatch system.

C. Standardized medical reporting system that ensures commonality in data reporting and systems analysis.

D. Expansion and improvement of basic life support and advanced life support training as necessary to accommodate the needs of the public throughout the state.

E. Public information and education programs that reach one out of every four persons in the state with emphasis on the secondary school system.

F. Periodic evaluation of minimum criteria for pre-hospital transport systems.

G. Strengthening medical control of all basic and advanced life support systems.

H. Biennial re-evaluation of hospital facilities in relation to their patient care profile.

I. Assisting in the improvement of local systems management and development by supporting local funding and suitable legislation.

J. Annual evaluation of the emergency medical services system with emphasis on the implementation of selected tracer studies.

Police Traffic Services

The federally mandated "55 MPH" enforcement program will continue to be funded during the 1984 fiscal year. There will be no additional enforcement programs funded with traffic safety funds during the coming year. One of the Commission's emphasis programs in FY 1985 will be directed toward the Community DWI Task Forces. It is hoped that selective traffic enforcement program directed at the drunk drivers will be emphasized in these communities. Seattle's DWI Sobriety Checkpoint Program is a case in point. The locations for the checkpoints are determined from traffic records indicating areas where alcohol-related crashes are occurring.

Many of the enforcement programs initiated with Washington Traffic Safety Commission funds are being continued by local and state funding.

Courts Management Improvements

A. Judicial Information System - The Supreme Court set the state's Judicial Information System in motion in 1973 with the establishment of a special committee to study potential uses of automation within the judicial branch of government. System development began at the superior court level in 1976 with grants from the Law Enforcement Assistance Administration (LEAA) and the Traffic Safety Commission. The same year, Supreme Court Rules (JISCR) formally established the JIS Committee and the controlling policy environment. Additional LEAA grants helped initiate computer systems for the Supreme Court and Court of Appeals and for juvenile courts and courts of limited jurisdiction. In 1981, following recommendation by the committee and its chairman, Justice Robert F. Brachtenbach, the Legislature allocated funds to the system via assessments on system users.

During 1983, JIS continued its steady growth as more courts and more new functions were added to the sytem. JIS now records all cases at the appellate court level, 85 percent of all superior court cases, and 97 percent of all juvenile court cases.

While 42 percent of the cases processed by courts of limited jurisdiction use some automated data processing provided by JIS, 1983 marked the initiation of the expanded DISCIS minicomputer system. Five courts, representing ten percent of the total caseload, had been converted through December.

DISCIS - Installation of the District/Municipal Court Information System began in 1983, and five courts were in operation on the new system by year's end. Presently, DISCIS offers citation and civil case filing; name indexing, case tracking, calendaring and docketing; summons and bail notices; failure-to-appear and warrant management; caseload statistics; and fiscal controls, including cashiering, trust and time-pay accounting and management reports. A continuing installation schedule is anticipated to provide DISCIS services as rapidly as possible to a large number of courts of limited jurisdiction.

B. Law-related Education - Judicial interest in law-related education, was reawaken 1982 with the formation of the Law-related/Citizen Education Coalition. A non volunteer organization of educators, lawyers, judges, law enforcement offic community leaders, the group works to promote the placement of law-related in the curricula of the state's elementary and secondary schools.

In early 1983, a statewide community relations seminar, designed primarily for judges, gave further impetus to that activity. Sponsored by the Board of Judiciary Education and staffed by the Office of the Administrator for the Courts, the seminar featured a special segment on law-related education or "LRE." As a result of that event, several judges from one jurisdiction formed themselves into a team, added educators, lawyers and others, then began making plans for the infusion of law-related education topics into the curricula of school districts in their area.

C. Jury Management - In 1983, seven counties continued their participation in the jury management program sponsored by the Office of the Administrator for the Courts.

Courts involved in the program are implementing procedures that will minimize costs, decrease administrative time, and increase juror satisfaction while continuing to preserve the integrity and randomness of the juror selection process.

During 1983, courts in the following counties participated in the jury management program: Clark, King (Seattle Municipal Court), Kitsap, Mason, Pacific, Skagit, and Thurston.

Major elements of the program include: (1) collection of jury data for monitoring and analysis, (2) implementation of juror call-in systems, (3) design of new forms (summons/qualifications, certificates, data collection instruments, data mailers, etc.), and (4) adoption of standard panel sizes and excusal and postponement policies.

In addition, the Washington Pattern Instructions Committee, in conjunction with the Superior Court Judges' Association and the Washington State Magistrates Association, revised and edited the *Juror's Handbook to Washington Courts*. Eighty-thousand handbooks were distributed to superior, district, and municipal courts in the Fall of 1983.

D. Interagency Group Efforts - The Office of the Administrator for the Courts worked with the Department of Social and Health Services' Bureau of Alcohol and Substance Abuse to implement legislation allowing misdemeanant probation departments to perform alcohol evaluations on DWI defendants. Working through the Board for Judiciary Education, the Office of the Administrator for the Courts' staff developed a reimbursement process to pay expenses of probation officers wishing to obtain college credits to allow them to become certified alcohol counselors.

E. Statistical Reporting - Caseload reports submitted monthly by county clerks for the superior courts and by administrative personnel for courts of limited jurisdiction, provide basic statistics on filings, dispositions, proceedings, and other court activity. As fundamental indicators of workload, these statistics are used in decision-making related to allocation of resources by local and state government. They also assisted in the examination of court policies and procedures. Therefore, accuracy of caseload statistics and their comparability among courts is essential.

Considerable effort was expended in 1983 to improve the quality of information of these reports. Since most superior court monthly statistics are obtained from the Superior Court Management Information System (SCOMIS), research and statistics personnel of the Office of the Administrator for the Courts focused attention on improving codes and definitions used in that system. These efforts resulted in a revised reporting format and a manual of instructions. Work was also completed during the year to permit automated extraction of monthly statistics from SCOMIS for counties opting to enter data on pre-SCOMIS case activity into the system.

ANALYSIS OF SELECTED TRAFFIC PROBLEMS

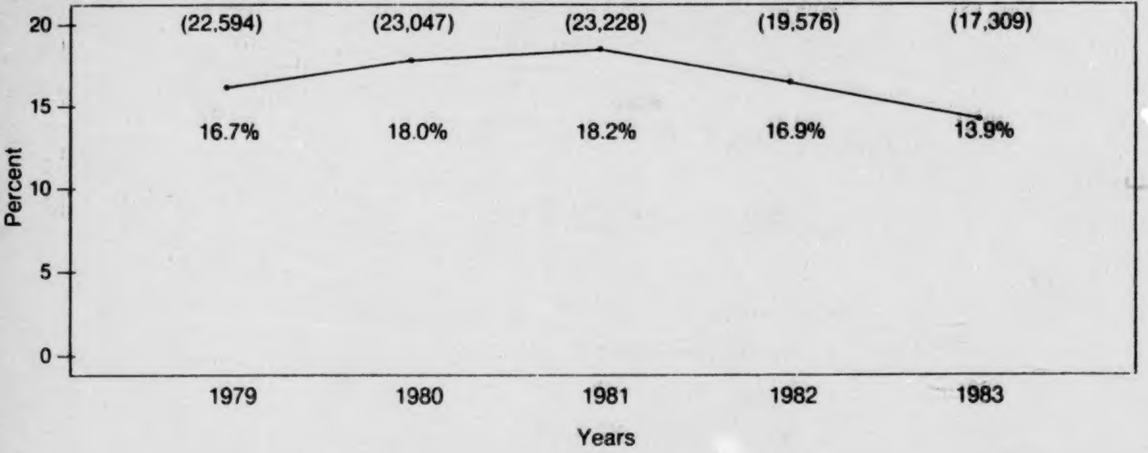
- **Alcohol Involvement**
- **Youth Involvement**
- **Safety Restraint Usage**
- **Motorcycle Collisions**
- **Pedalcycles**
- **Pedestrians**
- **Heavy Trucks**
- **Pupil Transportation**
- **Contributory Driver Violations**
- **Vehicle Defects**

ALCOHOL INVOLVEMENT

Overview

In 1983, 13.9% of all drivers involved in traffic collisions had been drinking alcohol. This is a 17.8% decrease over 1982 and continues a two-year downward trend which reverses the 1979 thru 1981 trend where the number of drivers who had been drinking had been increasing (Figure 2-1).

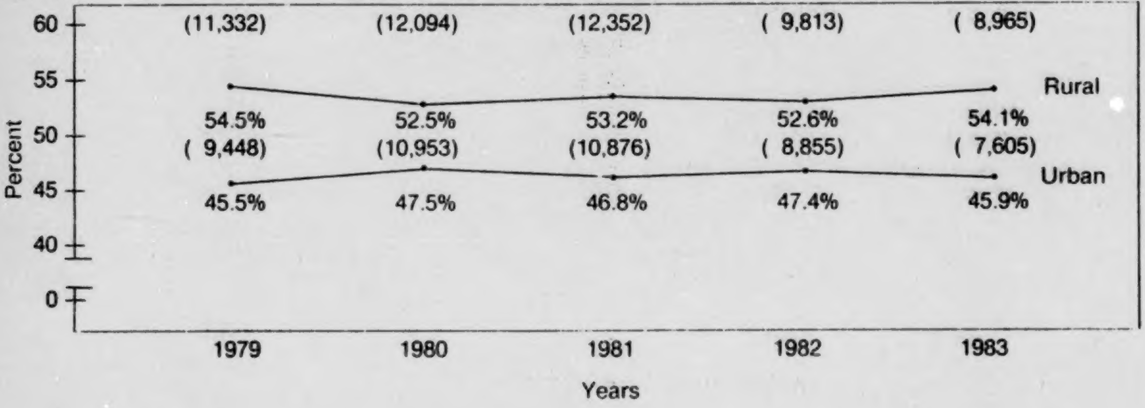
Figure 2-1 Alcohol Involvement of Drivers in Total Collisions



Location of Alcohol Related Collisions

In 1983 the urban-rural breakdown of alcohol involved collisions shifted slightly with an increase in rural areas and a decrease in the urban areas compared to 1982 — 45.9% of the alcohol related collisions occurred in urban areas and 54.1% occurred in rural areas (Figure 2-2).

Figure 2-2 Alcohol Related Collisions by Urban and Rural Areas



Multiple vehicle crashes have been the predominant type of alcohol-related mishaps in urban areas. They occurred significantly more often than single vehicle accidents (Figure 2-3). The opposite is true in rural areas. Single vehicle accidents involving alcohol were significantly more prevalent than multiple vehicle collisions (Figure 2-4). In 1983, alcohol-related accidents maintained these trends. Sixty-five point four percent (65.4%) of the urban alcohol-related collisions were of the multiple vehicle type, while on rural roads, 64.8% of the alcohol-involved collisions were single vehicle.

Figure 2-3 **Urban areas, percentage of single vs. multiple alcohol involved Vehicle Collisions**

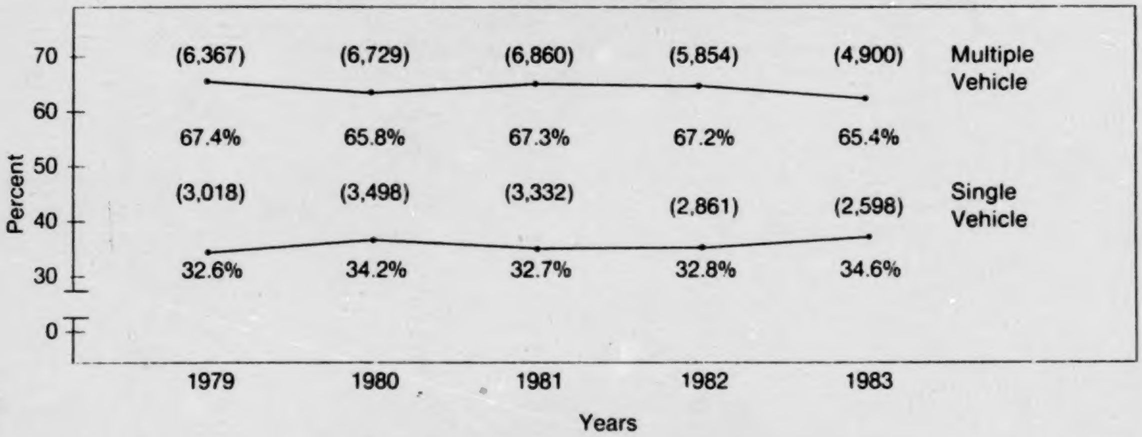
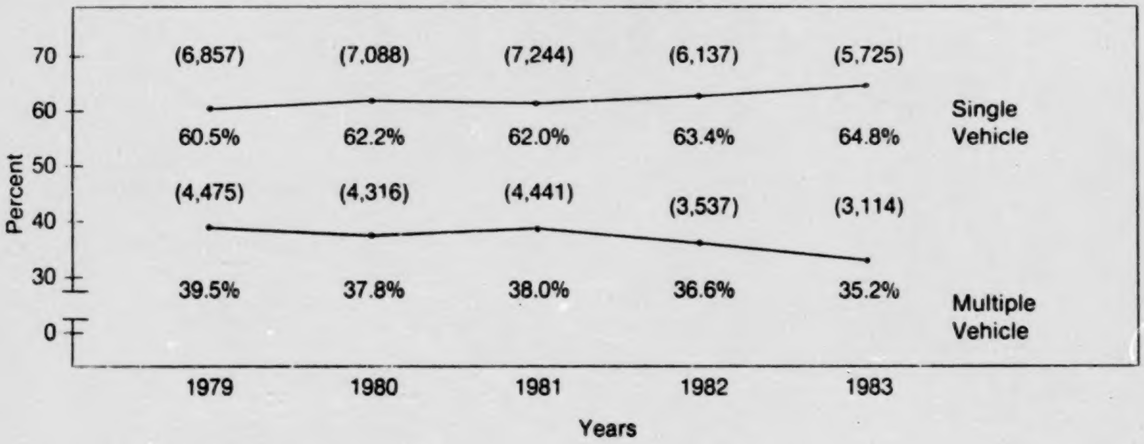


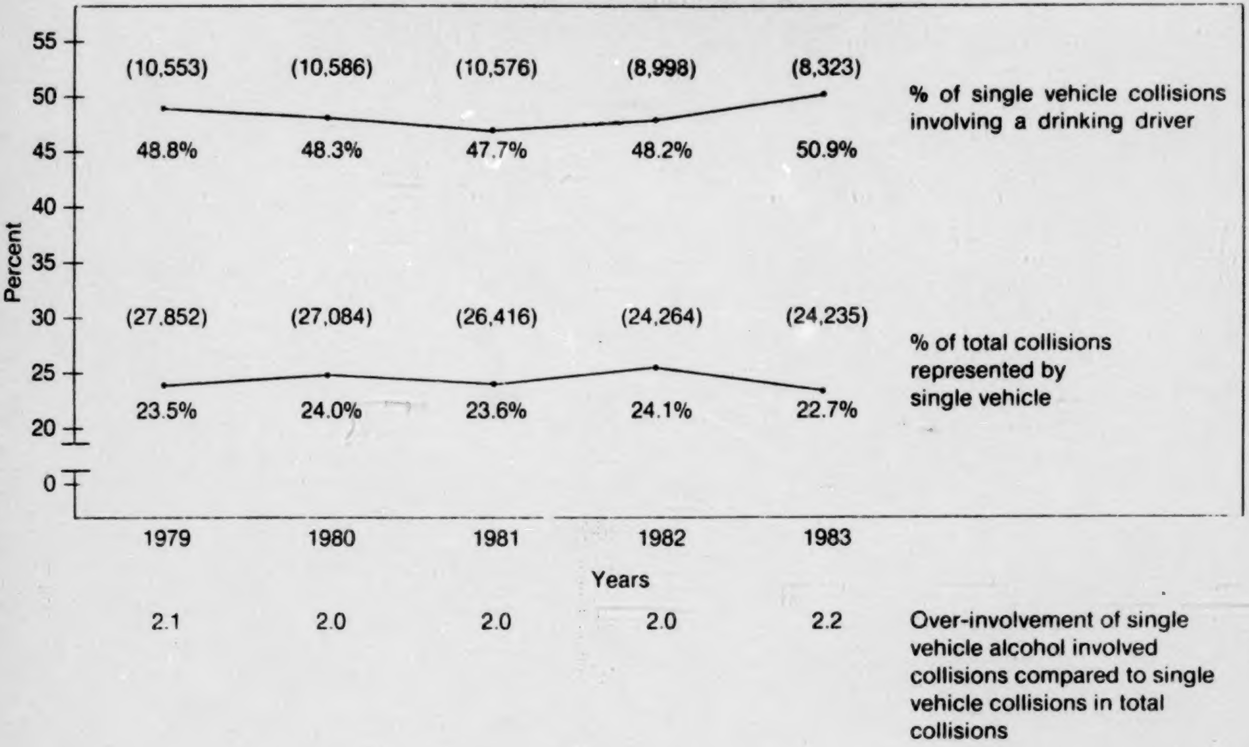
Figure 2-4 **Rural areas, percentage of single vs. multiple alcohol related Vehicle Collisions**



Single Vehicle Accidents Involving Alcohol

In 1983 the percentage of all single vehicle accidents where the driver had been drinking remained relatively stable at nearly 50% of the total single vehicle accidents. The percentage of total accidents that the single vehicle accident represents has also remained relatively constant (Figure 2-5). Comparing the percentage of alcohol involvement in single vehicle collisions to the percentage of total collisions the single vehicle collision represents, allows for the generation of a ratio to express the over-representation of alcohol in single vehicle collisions. In 1983, this ratio increased to 2.2. The highest in the five year history.

Figure 2-5 **Alcohol Involvement In Single Vehicle Collisions Compared to the percent of Total Collisions Involving Single Collisions**



Drivers Involved in Fatal Collisions

In 1983, 39.4% of the drivers involved in statewide fatal collisions had been drinking intoxicants. This was a 16.5% decrease over the four year baseline period. In the rural areas 41.0% of the drivers involved in fatal accidents had been drinking alcohol, a decrease of 14.2% over the baseline. Urban areas recorded a 35.5% alcohol involvement rate in 1983. This was a 22.0% decrease in the percentage of alcohol involvement compared to the 4 year average (Table 2-1).

Table 2-1

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS

		Drivers Involved in Fatal Collisions						
	Condition of Driver (Sobriety)	**1979**	**1980**	**1981**	**1982**	**Prev. 4 Yr. Average**	**1983**	**Change 83 - 4 Yr. Avg.**
STATEWIDE	Had been drinking - ability impaired	426	437	364	333	390	260	- 33.3%
	Had been drinking - ability not impaired	77	62	74	39	63	37	- 41.3%
	Had been drinking - sobriety unknown	56	69	68	51	61	31	- 49.2%
	Had not been drinking	669	584	556	489	575	502	- 12.7%
	Not stated	101	94	71	49	79	62	- 21.5%
	Total drivers	1,329	1,246	1,133	961	1,167	892	- 23.6%
	Total driver drinking	559	569	506	423	514	328	- 36.2%
	Total drivers - excluding not stated	1,228	1,152	1,062	912	1,089	832	- 23.6%
	No. drinking drivers per 100 involved	45.5	49.4	47.6	46.4	47.2	39.4	- 16.5%
	No. of drunk drivers per 100 involved	34.7	37.9	34.3	36.5	35.8	31.3	- 12.6%
RURAL	Had been drinking - ability impaired	318	328	291	265	301	198	- 34.2%
	Had been drinking - ability not impaired	51	47	57	28	46	28	- 39.1%
	Had been drinking - sobriety unknown	38	48	46	36	42	24	- 42.9%
	Had not been drinking	506	419	406	362	423	360	- 14.9%
	Not stated	45	44	33	21	36	32	- 11.1%
	Total drivers	958	886	833	712	847	642	- 24.2%
	Total driver drinking	407	423	394	329	388	250	- 35.6%
	Total drivers - excluding not stated	913	842	800	691	812	610	- 24.9%
	No. drinking driver per 100 involved	44.6	50.2	49.3	47.6	47.8	41.0	- 14.2%
	No. of drunk drivers per 100 involved	34.8	39.0	36.4	38.4	37.1	32.5	- 12.4%
URBAN	Had been drinking - ability impaired	108	109	73	68	90	62	- 31.1%
	Had been drinking - ability not impaired	26	15	17	11	17	9	- 47.1%
	Had been drinking - sobriety unknown	18	21	22	15	19	7	- 63.2%
	Had not been drinking	163	165	150	127	151	142	- 6.0%
	Not stated	56	50	38	28	43	30	- 30.2%
	Total drivers	371	360	300	249	320	250	- 21.9%
	Total driver drinking	152	145	112	94	126	78	- 38.1%
	Total drivers - excluding not stated	315	310	262	221	277	220	- 20.6%
	No. drinking drivers per 100 involved	48.3	46.8	42.7	42.5	45.5	35.5	- 22.0%
	No. of drunk drivers per 100 involved	34.3	35.2	27.9	30.8	32.5	28.2	- 13.2%

Alcohol Involvement by Age Group

The younger driver, under 30 years of age, is over-represented in alcohol-related accidents. In 1983, the 16-20 year old drivers were involved in 18.5% of all alcohol-related accidents while comprising only 8.3% of all licensed drivers. The over-representation ratio for this age group is 2.2, indicating that the 16-20 year old drivers were involved in 2.2 times more alcohol-related collisions than the percentage of licensed drivers they represent. The 2.2 over-representation ratio was the same as the previous year (Figure 2-6). The 21-24 year old group is also involved in twice as many alcohol-related collisions as the portion of total drivers this age group represents. The over-involvement ratio of 2.4 is above the previous year (Figure 2-7). In 1983, the 25-29 year old group was involved in 1.45 times more alcohol-related crashes than the percentage of licensed drivers they represented. This group's over-involvement ratio increased from the previous year (Figure 2-8). The remaining age group, 30 years and older, was .60 times under-represented in alcohol-related crashes (Figure 2-9).

Figure 2-6 **16 - 20 Year Old Involvement In Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group**

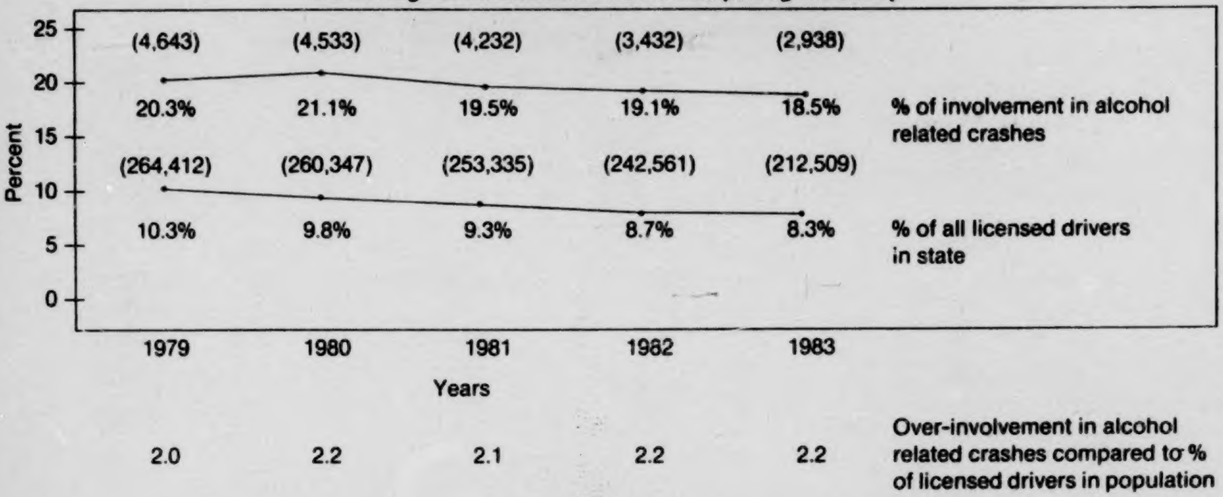


Figure 2-7 **21 - 24 Year Old Involvement In Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group**

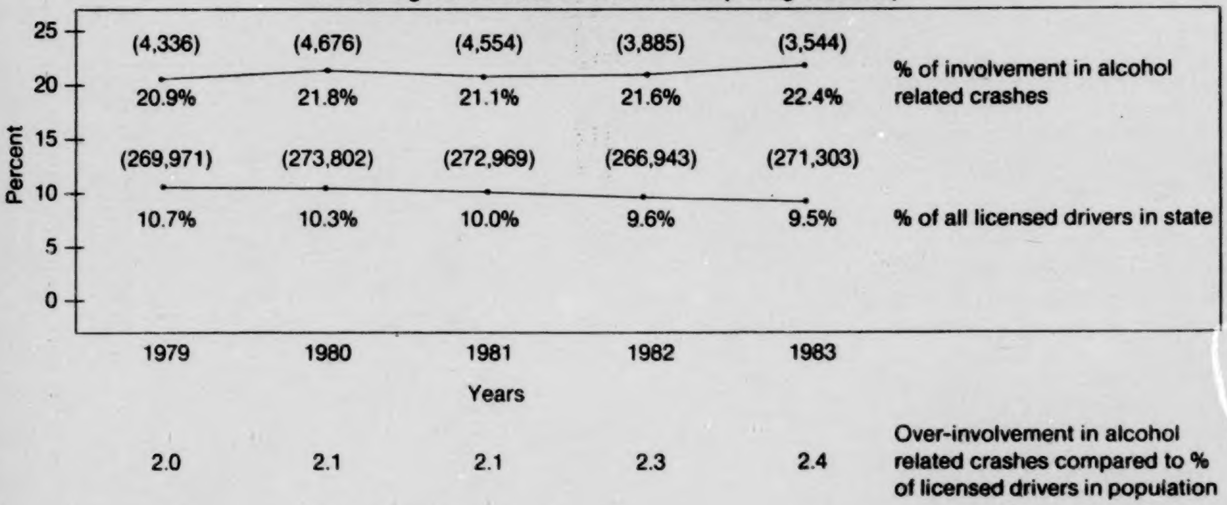


Figure 2-8

25 - 29 Year Old Involvement in Alcohol Related Crashes as a Percentage of all Licensed Drivers Comprising the Group.

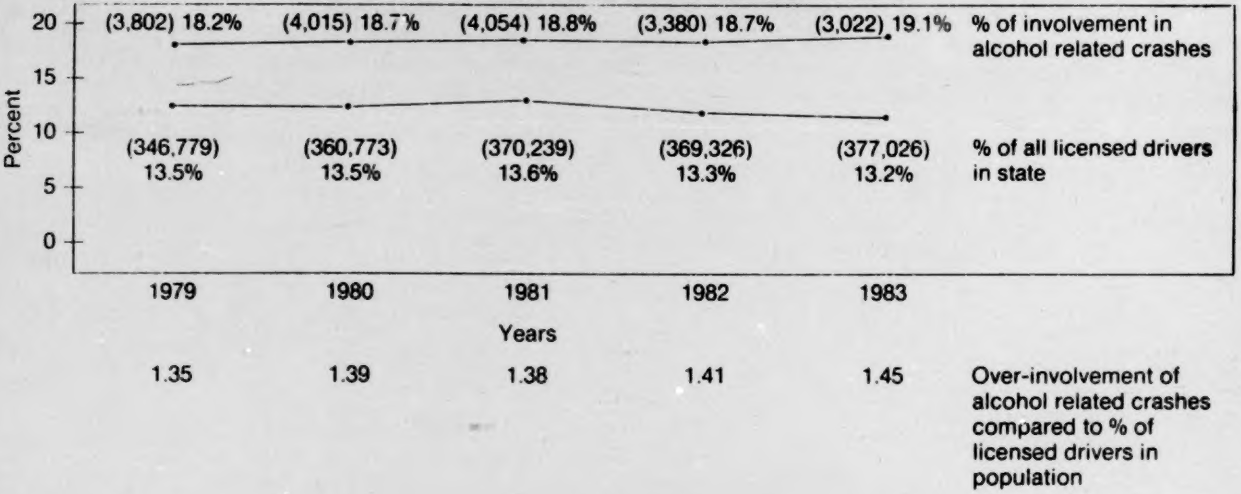
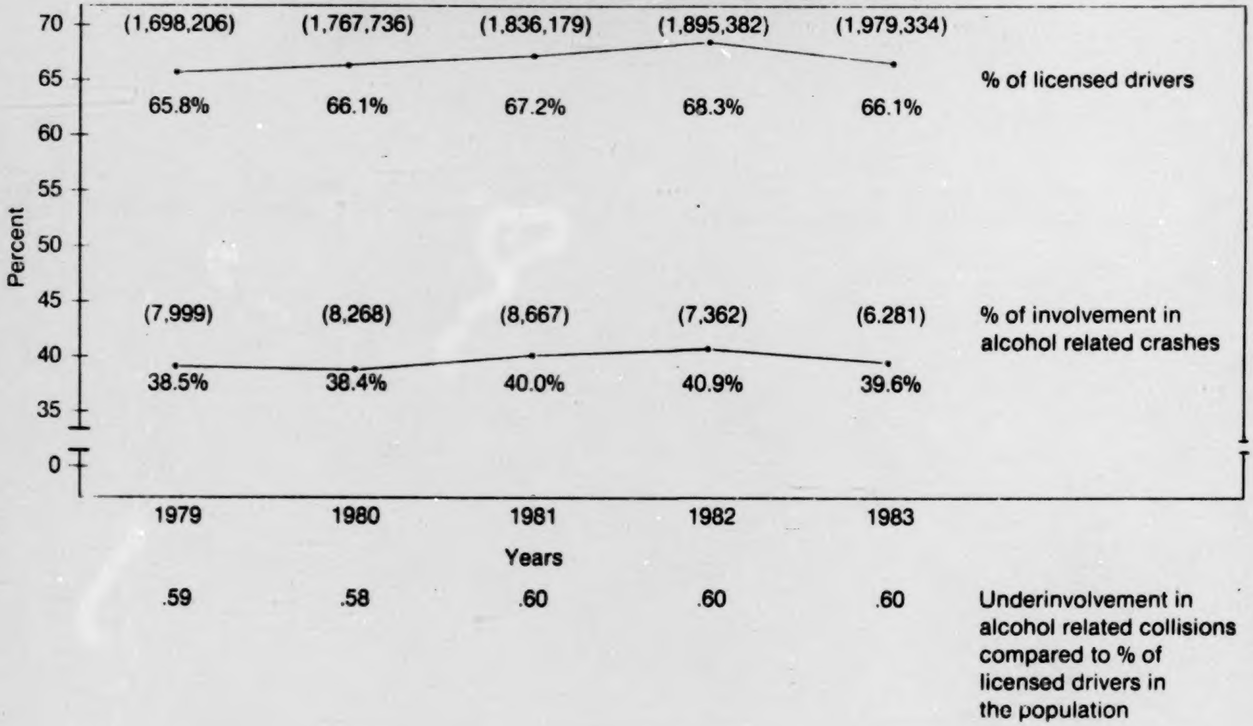


Figure 2-9

30 Year Old and Older Involvement in Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group



Weekend Alcohol Involvement

In 1983, the percentage of alcohol related collisions occurred at a rate 1.7 times greater than all weekend collisions (Friday 6 P.M. to Sunday midnight). This over-representation ratio increased from 1982, which was the same as the previous two years (Figure 2-10). In a further breakdown of weekend alcohol related collisions comparing the percentage of alcohol involved collisions occurring Friday and Saturday between the hours of 8 P.M. to 3 A.M. (select time period) to the percentage of the total week's accidents that occur in this select time period, the alcohol related collisions are 2.8 times over-represented. This is higher than the previous two years (Figure 2-11).

Figure 2-10 **Alcohol Involvement in Weekend Collisions Compared to the Percentage of all Weekend Collisions**

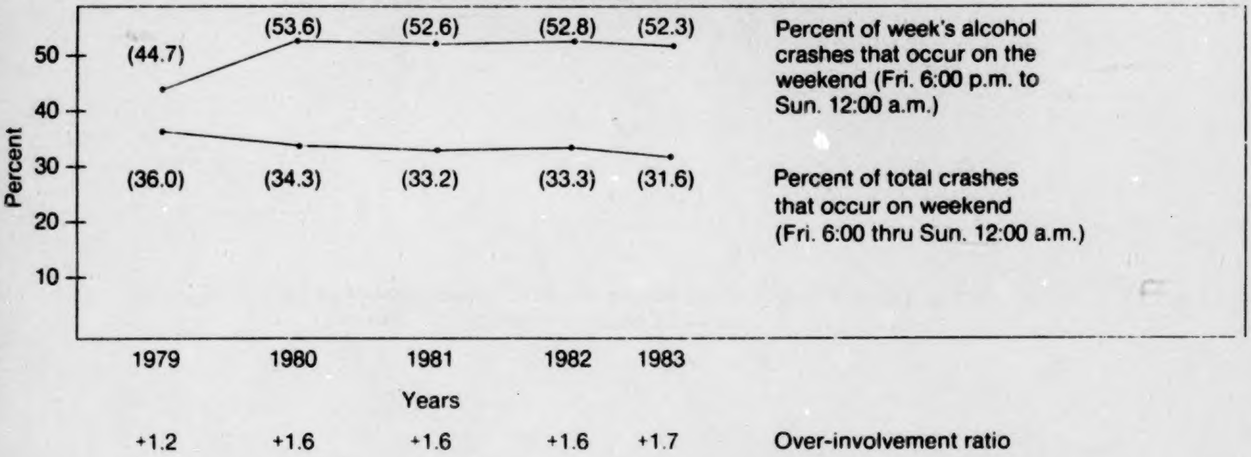
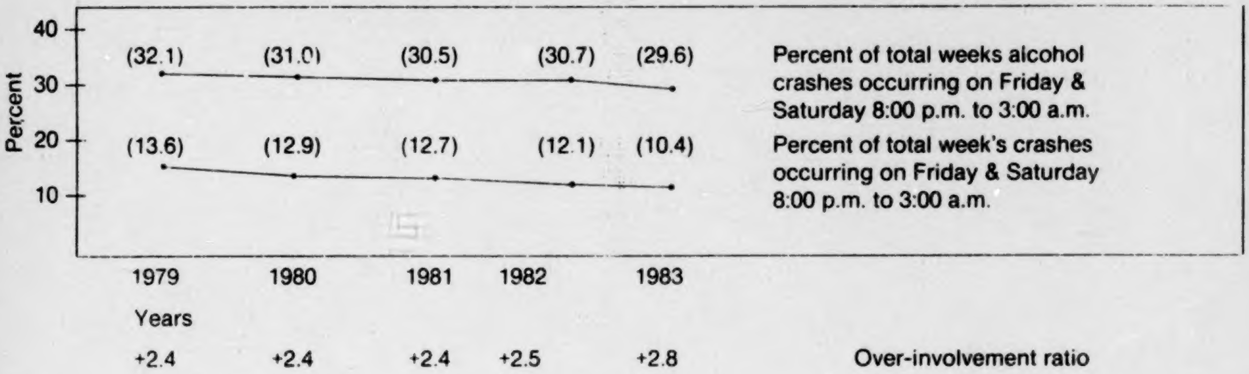


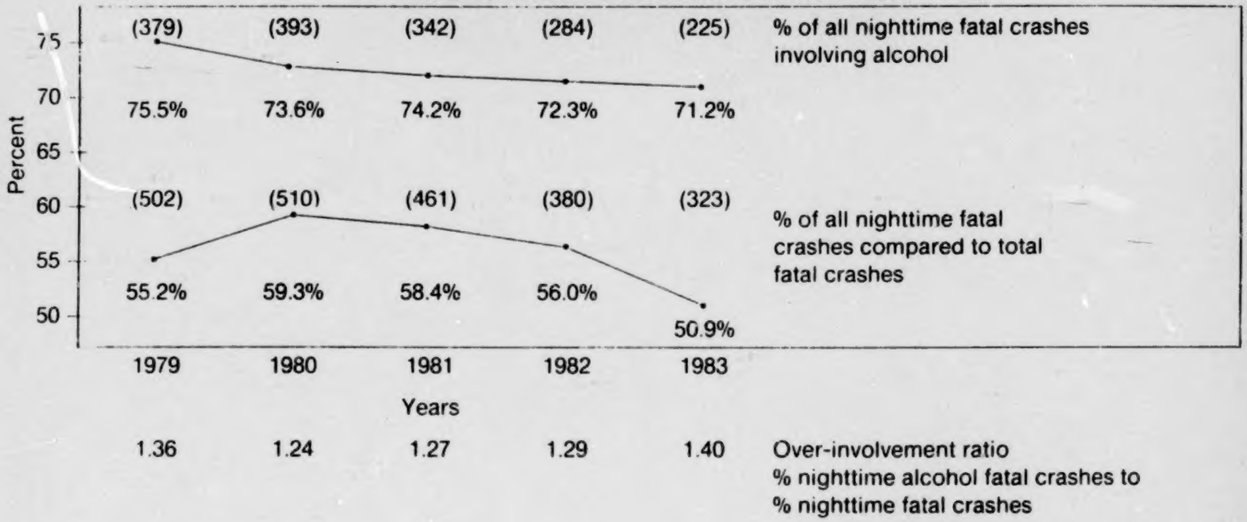
Figure 2-11 **Alcohol Involved Collisions Occurring in the Select Time Period (Friday and Saturday Between 8 P.M. to 3 A.M.) to the Percentage This Time Period Contributes to the Total Week's Collisions**



FATAL ALCOHOL INVOLVED CRASHES OCCURRING AT NIGHT

Alcohol involvement in nighttime fatal crashes has remained fairly constant over the last five years. The percentage of all nighttime fatal crashes decreased slightly in 1983. Alcohol-involved nighttime fatal crashes had an over-representation ratio of 1.40. This over-representation is up from the 1.29 for 1982 (Figure 2-12).

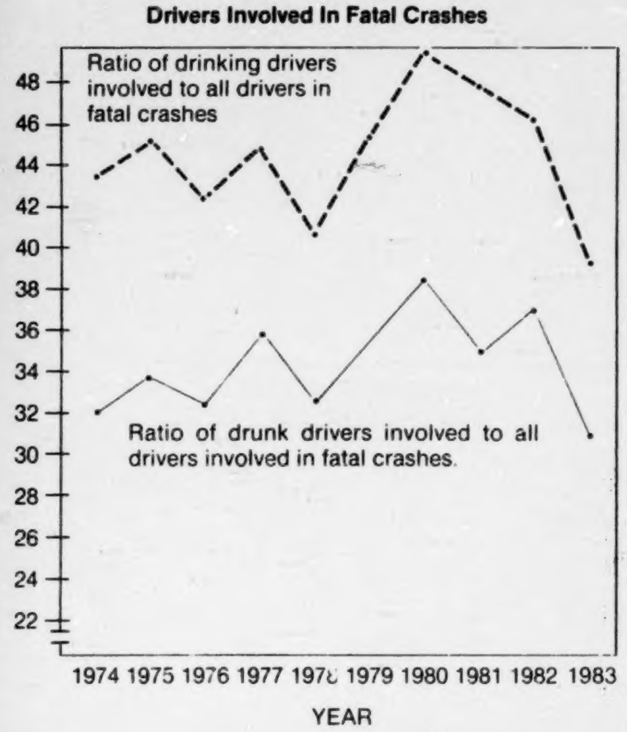
Figure 2-12 **Fatal Alcohol Involved Crashes Occurring at Night Compared to the Percentage of All Fatal Crashes Occurring at Night.**

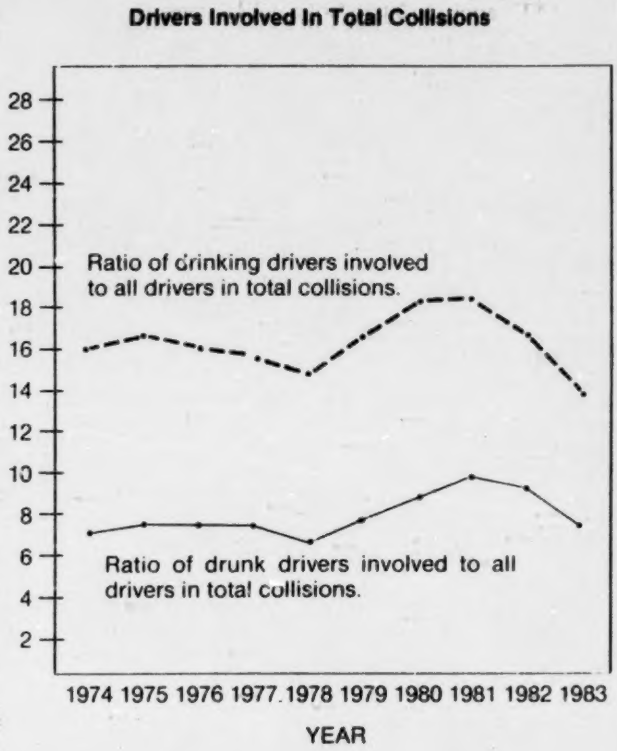


RATIO OF DRINKING AND DRUNK DRIVERS INVOLVED IN TRAFFIC COLLISIONS

Thirty-nine percent of all drivers involved in fatal collisions had been drinking prior to the crash. This marked the third consecutive year of decline in drinking drivers following a 49.4% rate in 1980, which was a nine year high (Figure 2-12). Nearly 14% of the drivers involved in all investigated collisions had been drinking prior to the collision. The 1983 drinking driver total of 17,309 represents a 17.7% decline compared to the previous 3-year coverage (Figure 2-13).

Figure 2-12 **Ratio of Drinking and Drunk Drivers Involved In Traffic Collisions**
1974 - 1983 **Figure 2-13**


Drivers Involved In Fatal Crashes


Drivers Involved In Total Collisions

The total frequency of particular blood alcohol concentration (BAC) levels in fatal and serious injury collisions between 1979 and 1983 by age groups is presented in Table 2-2. The 16-19 and 20-24 age groups had the greatest incidence of involvement for .00-.15 BAC levels. At the .16-.20 BAC range, the 20-24 age group had the greatest frequency of occurrences. Overall, the 16-19, 20-24, and 25-29 age groups display the highest incidence of involvement at all BAC levels.

Table 2-2

Chemical Test for Intoxication in Fatal and Serious Injury Collisions for 1979, '80, '81, '82, '83

Age	.00-.05	.06-.10	.11-.15	.16-.20	.21-.25	.26-.30	.31 & Up	Test Given No Results	Test Refused	Total Tested
16-19	204	571	1,067	732	194	34	9	156	215	3,182
20-24	123	454	1,059	954	376	67	15	174	394	3,616
25-29	99	283	857	827	407	107	28	140	450	3,198
30-34	52	183	467	604	316	92	27	80	340	2,161
35-39	31	85	293	364	200	63	16	66	242	1,360
40-44	23	58	221	280	153	44	24	37	145	985
45-49	13	38	137	228	151	45	9	26	118	765
50-54	19	38	143	195	112	51	7	21	67	653
55-59	13	38	107	147	91	26	14	16	55	507
60-64	14	30	84	120	51	20	8	12	35	374
65-69	7	18	60	52	22	5	0	13	16	193
Over 69	11	16	36	34	13	8	0	6	8	132
TOTAL	609	1,812	4,531	4,537	2,086	562	157	747	2,085	17,126

In a further breakdown of alcohol-involved fatal and serious injury accidents for 1983, an analysis of roadway type by day of week on which the accidents occurred is presented in Table 2-3. A finer distinction of the rural-urban location of alcohol-involved collisions reveals 34.5% occurred on county roads while 32.1% took place on city streets. U.S. and state routes accounted for 23.0% of the total. Interstates and full control access roads contributed the remaining 9.3% of the total alcohol-related fatal and serious injury accidents during this time period. The table also indicates that during 1983, Saturday was the day of the week with the greatest frequency of alcohol-related fatal and serious injury accidents. The other two weekend days, Sunday and Friday, have the next greatest frequencies of these accidents.

Table 2-3

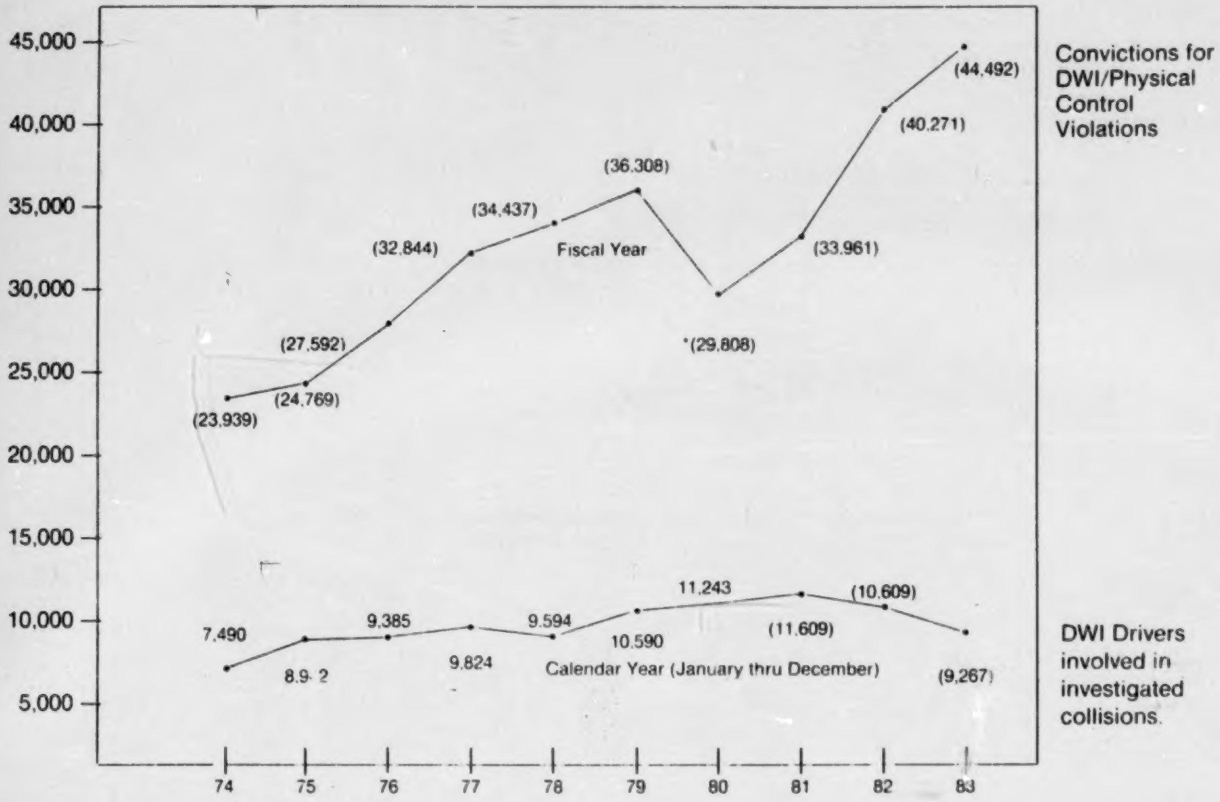
Fatal and Serious Injury Collisions Involving Alcohol — 1983 Roadway Type by Day of Week

Roadway Type	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Row Total	Percentage of Total Weekly Collisions	Percentage of Previous 5 Year Average
County Roads	221	211	213	239	365	536	475	2,260	34.5%	33.1%
City Streets	194	239	216	250	311	507	392	2,109	32.1%	30.1%
U.S. & State Routes	137	126	149	183	220	415	280	1,510	23.0%	26.5%
Interstate & Full Control	51	55	75	68	110	136	116	611	9.3%	9.5%
Other Routes	6	7	6	7	12	19	15	72	1.1%	0.8%
TOTAL	609	638	659	747	1,018	1,613	1,278	6,562	100.0%	100.0%
Percent - 1983	9.2%	9.7%	10.1%	11.4%	15.5%	24.6%	19.5%	100.0%		
Percent - Previous 5 Year Average	8.8%	9.2%	9.8%	11.0%	16.4%	25.9%	18.9%	100.0%		

n 1983 the number of convictions for alcohol-related traffic offenses reached a new high of 44,492. This figure is a substantial increase over 1982 and continues an upward trend that began in 1980. In 1983 the number of DWI drivers nvolved in investigated collisions declined to 9,267 from the 9-year high of 11,609 recorded in 1981 (Figure 2-14).

Figure 2-14

Comparison of Convictions for DWI/Physical Control Violations
and
DWI Drivers Involved in Investigated Collisions
1974 - 1983



*Convictions for physical control of vehicle while under the influence decreased from 10,520 in FY 1979 to 1,866 convictions in FY 1980. DWI convictions increased from 25,788 in FY 1979 to 27,942 in FY 1980.

In examining accident involvement by driver's age and percent of vehicle miles traveled for each age group, it will be noted that the 16-17 age group has the greatest over-representation in overall accidents at 3.33:1. The second most over-represented group in overall accidents was the 18 year olds. The age group with the greatest under-representation based on miles traveled was the 45-54 year olds. The age group with the greatest over-representation in alcohol-involved collisions based on miles traveled was 21 years old, an over-representation ratio of 2.81:1. The 18 year olds had the second highest alcohol-involved over-representation ratio at 2.23:1. The age group with the greatest under-representation for alcohol-involved accidents was 45-54 year olds (Table 2-4).

Table 2-4

Comparison of Miles Traveled
All Reported Accidents & Alcohol Involved Accidents
By Age of Driver — 1983

Driver Age	Percent of Vehicle Miles Traveled*	Percent of All Accident Drivers**	Over/Under Representation Ratio	Percent of All Alcohol Involved Accidents	Over/Under Representation Ratio
16-17	1.95	6.50	3.33:1	3.78	1.94:1
18	1.97	4.38	2.22:1	4.40	2.23:1
19	2.31	4.20	1.82:1	5.02	2.17:1
20	2.74	3.98	1.45:1	5.42	1.98:1
21	2.31	3.97	1.72:1	6.50	2.81:1
22-24	8.38	10.46	1.25:1	16.00	1.91:1
25-34	27.40	26.93	.98:1	31.91	1.16:1
35-44	19.48	16.00	.82:1	13.90	.71:1
45-54	17.53	9.03	.52:1	6.68	.38:1
55-64	10.73	7.52	.70:1	4.31	.40:1
65 & Over	5.10	6.61	1.30:1	2.13	.45:1

*Source — National Accident Sampling System (NASS) — 1979-80
**Source — Accident Records Unit — Washington State Patrol

Table 2-5 presents a summary of the number of persons killed and injured, number of property damage accidents, and total reported accidents, for drivers under the influence, all drinking drivers, and non-drinking driver collisions. It should be noted that for all categories of the alcohol-related collisions decreases are reported in 1983 from the previous two years. By comparison increases were shown in all categories of the non-drinking driver collisions.

Table 2-6 indicates the number of persons killed and injured from drivers "under the influence" and "had been drinking" by month for 1981, 1982, and 1983. The months of July, August, and September reported the higher incidents of persons killed due to drivers who were classified as "under the influence" and "had been drinking" in all three years. The months of April through July recorded the most injuries due to the intoxicated drinking driver.

Table 2-5 Summary of Persons Killed and Injured in Alcohol Related Collisions
1981 - 1982 - 1983

	Drivers Under the Influence				All Drivers Who Had Been Drinking (HBD) (including DUI)				Non-Drinking Driver Collisions		
	1981	1982	1983	% of Change 83-82	1981	1982	1983	% of Change 83-82	1982	1983	% of Change 83-82
Persons Killed	389	366	299	-18.3%	516	442	364	-17.6%	315	341	+ 8.3%
Person Injured	9,266	8,202	7,446	- 9.3%	17,268	14,491	12,909	-10.9%	40,298	45,408	+12.7%
Disabling Injury	2,078	1,795	1,667	- 7.1%	3,609	3,018	2,634	-12.7%	5,258	5,766	+ 9.7%
Non-Disabling Injury	4,469	4,017	3,616	- 10.0%	8,330	7,035	6,260	-11.0%	15,305	17,678	+15.5%
Possible Injury	2,719	2,390	2,163	- 9.5%	5,329	4,438	4,015	- 9.5%	20,158	21,964	+ 9.0%
Property Damage Accidents	5,224	4,713	4,114	-12.7%	10,597	8,905	7,855	-11.8%	53,270	57,834	+ 8.6%
Total Reported Accidents	11,499	10,292	9,207	-10.5%	22,173	18,669	16,570	-11.2%	81,975	90,027	+ 9.8%

Table 2-6 Persons Killed and Injured in Alcohol Related Collisions By Month
1981 - 1982 - 1983

	From Drivers "Under the Influence"						From Drivers Who "Had Been Drinking"					
	Persons Killed			Persons Injured			Persons Killed			Persons Injured		
Month	1981	1982	1983	1981	1982	1983	1981	1982	1983	1981	1982	1983
January	25	23	23	773	586	527	29	28	29	1,363	1,101	893
February	24	21	12	682	625	568	31	23	14	1,277	1,090	910
March	26	24	24	754	677	631	34	29	27	1,318	1,118	1,031
April	31	34	27	754	714	670	40	37	38	1,411	1,215	1,207
May	32	38	23	775	745	689	47	44	24	1,492	1,352	1,236
June	33	32	29	728	664	665	54	44	33	1,497	1,202	1,183
July	41	43	29	791	804	719	48	51	37	1,488	1,516	1,239
August	56	41	35	869	721	622	76	46	40	1,716	1,312	1,039
September	34	44	33	741	734	599	43	59	37	1,381	1,252	973
October	29	36	22	820	729	647	40	41	29	1,441	1,231	1,139
November	31	18	24	744	518	613	42	26	33	1,379	1,004	1,162
December	27	12	18	835	685	496	32	14	23	1,505	1,098	897
TOTALS	389	366	299	9,266	8,202	7,446	516	442	364	17,268	14,491	12,909

YOUTH INVOLVEMENT

Overview

In 1983, the young drivers (20 years old and younger) comprised 8.3% of all licensed drivers. This group was involved in 19.5% of the total 1983 collisions, for an accident over-representation rate 2.3 times higher than the percentage of licensed drivers comprising this group. The 21-24 year old age group was involved in 14.4% of the total collisions, while comprising 9.5% of all licensed drivers. The over-representation factor for this group was 1.5. The 25-29 year old age group was the modal group. It represented 14.8% of all accidents and 13.2% of all licensed drivers. It was over-represented by a factor of 1.23. All other age groups with the exception of the 65-69 age group, were under-represented when comparing the percentage of involvement in accidents to the percentage of licensed drivers comprising the groups (Table 3-1).

DRIVER AGE DISTRIBUTION — 1983

Table 3-1 **COMPARISON OF DRIVERS INVOLVED TO NUMBER LICENSED**

Age of Driver	Involved in Collisions Number	% of Total	Percent of Licensed Driver	Over/Under Representation Ratio
Under 16	700	0.43	—	—
16	4,513	2.79	0.93%	3.00
17-18	13,091	8.09	3.24%	2.50
19-20	13,252	8.18	4.17%	1.96
21-22	12,318	7.61	4.60%	1.65
23-24	11,036	6.82	4.86%	1.23
25-29	24,002	14.82	13.15%	1.23
30-34	19,604	12.11	12.92%	.68
35-39	15,202	9.39	11.40%	.86
40-44	10,698	6.61	8.65%	.71
45-49	7,687	4.75	6.77%	.74
50-54	6,936	4.28	6.13%	.60
55-59	6,485	4.00	6.11%	.64
60-64	5,702	3.52	5.84%	.35
65-69	4,228	2.61	4.73%	1.09
70 and over	6,482	4.00	6.50%	.98

YOUTHFUL DRIVER INVOLVEMENT IN COLLISIONS BY FIRST HARMFUL EVENT

In 1983, 72.3% of youthful driver's (24 years old and younger) involvement in total collisions involved colliding with other moving vehicles. This type of collision also resulted in the greatest percentage of fatal collisions (37.9%) and injury collisions (67.4%). Single vehicle collisions with fixed objects led to the second largest percentage of youthful driver involvement in total, fatal and injury collisions, at 17.0, 34.5 and 19.3% respectively (Table 3-2).

Table 3-2 **YOUTHFUL DRIVERS BY FIRST EVENT — 1983**

	In Total Collisions	Percent of Total	In Fatal Collisions	Percent of Total	In Injury Collisions	Percent of Total
Collision with other moving motor vehicles	34,476	72.3%	100	37.9%	12,909	67.4%
Collision with parked vehicle	1,971	4.1%	5	1.9%	513	2.7%
Collision with fixed/ other object	8,101	17.0%	91	34.5%	3,702	19.3%
Overturning and other non-collision	2,170	4.5%	37	14.0%	1,322	6.9%
Other Collision with Ped/Pedal, Animal, R.R. Train	988	2.1%	31	11.7%	714	3.7%
TOTAL	47,706	100.0%	264	100.0%	19,160	100.0%

YOUTHFUL COLLISION INVOLVEMENT BY AGE GROUP

In 1983, the 16-20 year old age group's frequency and percent of involvement in total collisions continued to diminish along with the percent of total licensed drivers this age group comprises. This group's over-representation ratio (% of total collisions ÷ % of licensed drivers) of 2.51 was up from the 2.25 ratio for the past year. It is also the highest over-representation ratio for any age group (Figure 3-1). The 21-24 year old age group maintained an over-representation ratio of 1.5 for the fifth year in a row (Figure 3-2). The 25-29 year old age group had the smallest over-representation ratio of the youthful drivers in 1983 at 1.12 down slightly from the 1.15 ratio in 1982 (Figure 3-3). The 30 year old and over age group continues to be under-represented in total collisions compared to the percentage of licensed drivers this age group comprises (Figure 3-4).

Figure 3-1

16-20 Year Old % Of Involvement In Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

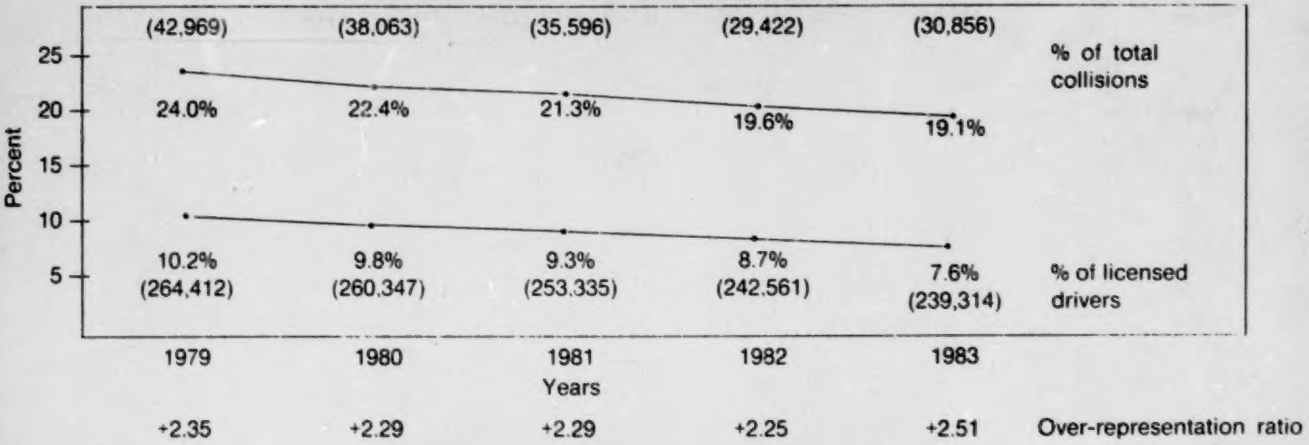


Figure 3-2

21-24 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

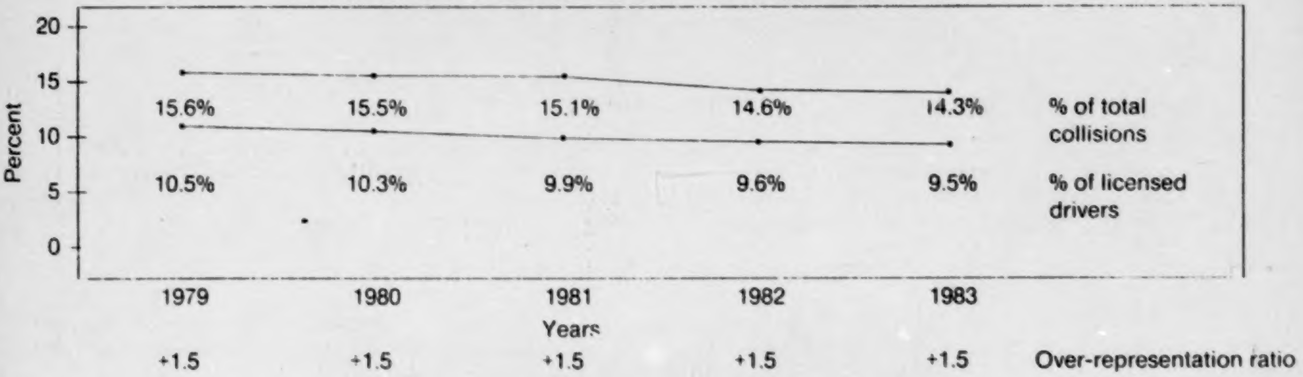


Figure 3-3

25-29 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

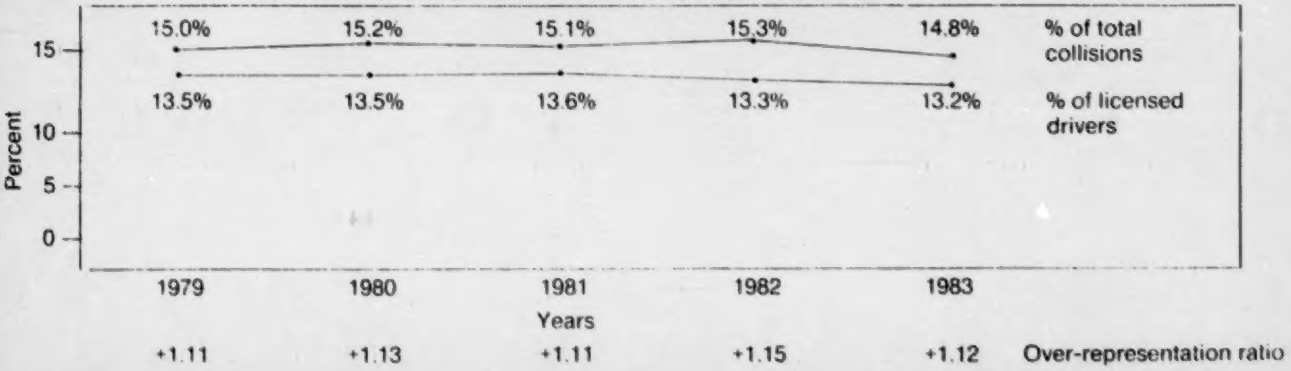
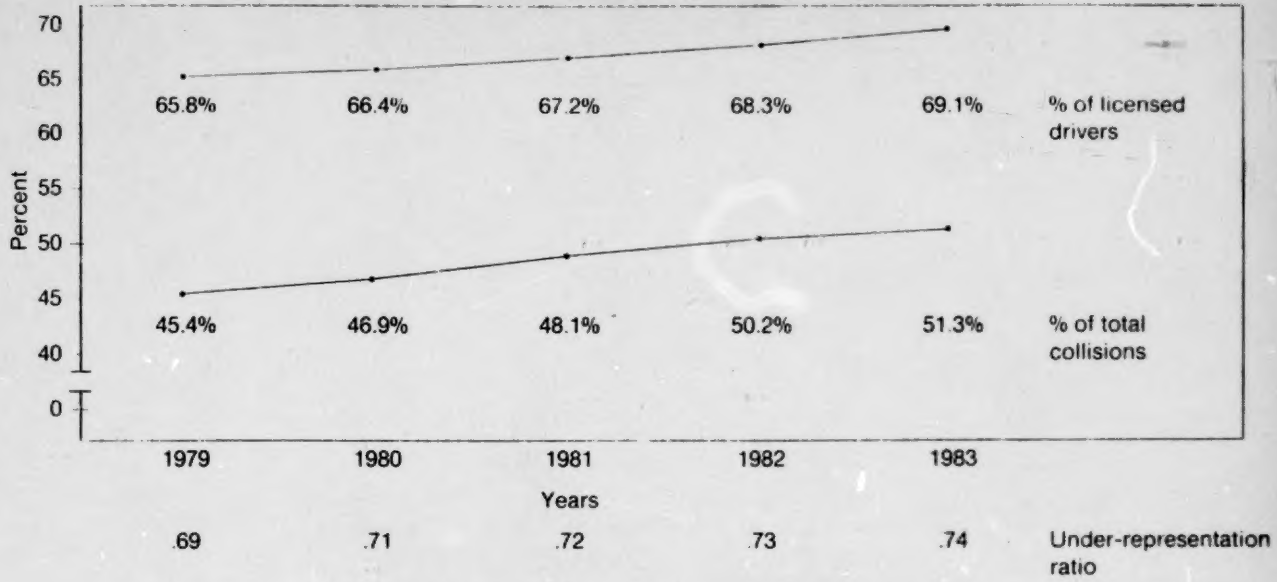


Figure 3-4 30 Years Old and Older % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group



COLLISION SEVERITY BY AREA FOR YOUTHFUL DRIVERS

In 1983, urban collisions involving youthful drivers (24 years old and younger) increased slightly to 57.2% while rural collisions involving youthful drivers made up 42.8% of the total (Figure 3-5). In 1983, youthful driver injury collisions were more prevalent in urban areas, though 1983 was a continuation of a five year decline toward convergence with the rural areas (Figure 3-6). Youthful driver fatal collisions were far more common in rural areas. In 1983, 75.8% of the fatal collisions involving youthful drivers occurred in rural areas (Figure 3-7).

Figure 3-5 Youthful Drivers Involved in Total Collisions

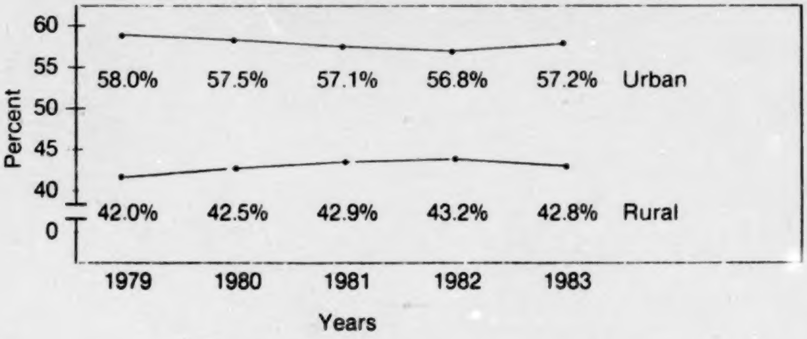


Figure 3-6 Youthful Drivers Involved In Injury Collisions

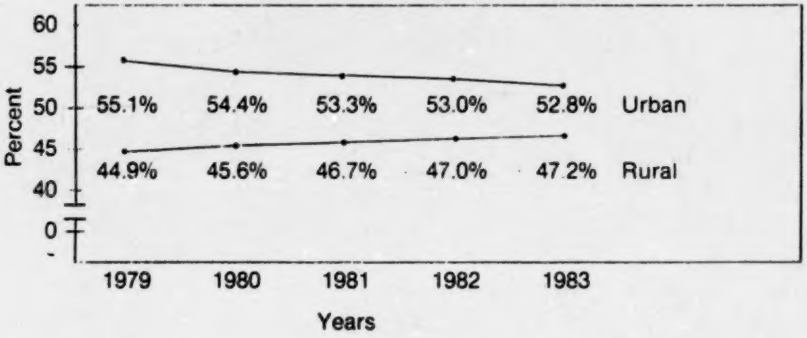
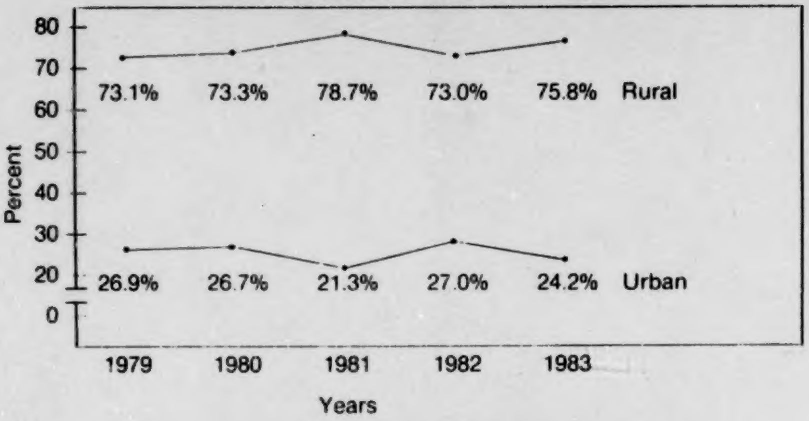


Figure 3-7



YOUTHFUL DRIVER INVOLVEMENT BY TIME

In 1983, 29.5% of all the rural fatal collisions and 18.1% of all rural reported collisions involving youthful drivers occurred on Saturday (Figure 3-8). In urban areas, Friday had the highest occurrence of collisions involving youthful drivers (18.5%) and Thursday & Friday had the greatest percentage of fatal collisions, each recording (18.8%) for this group (Figure 3-9).

Figure 3-8

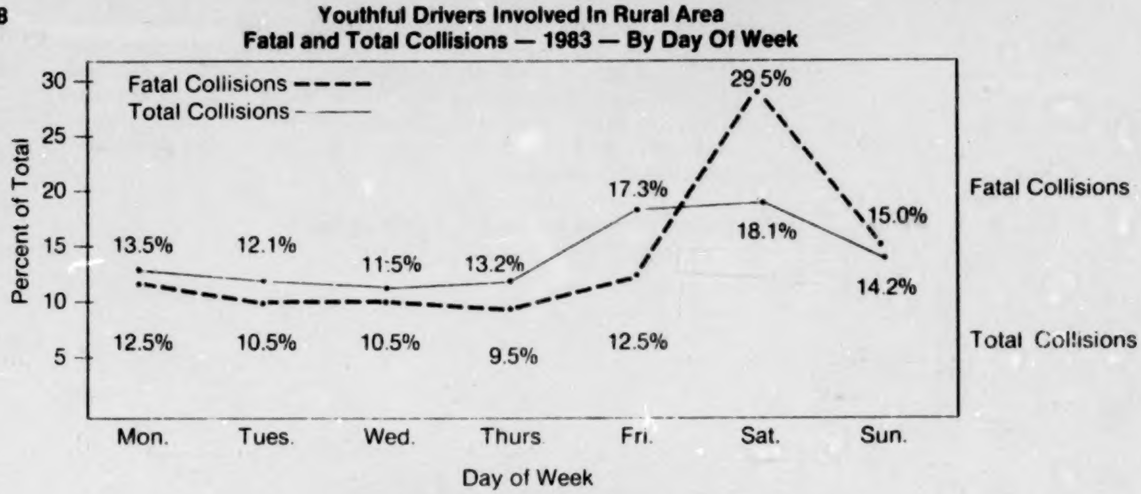
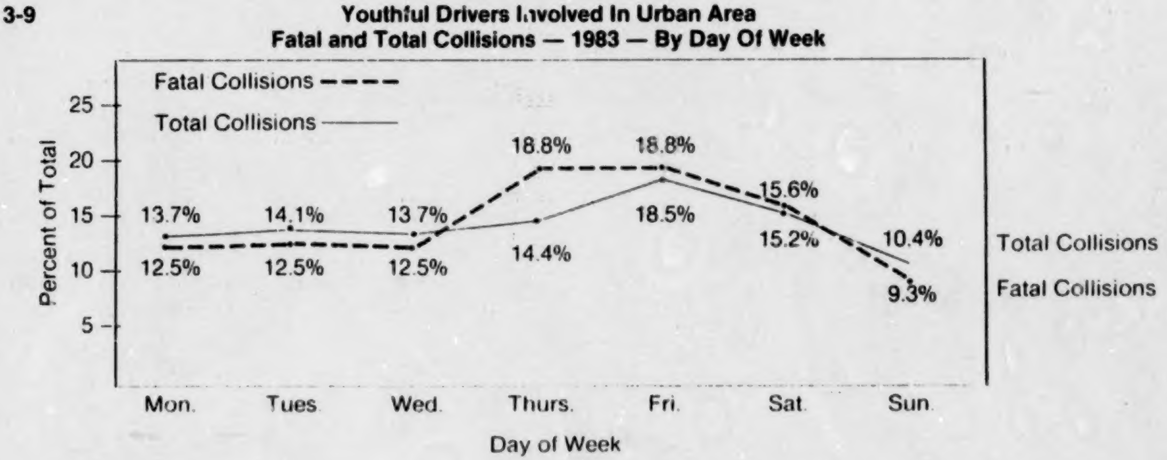


Figure 3-9



In rural areas, the six hour period from 9 PM to 3 AM recorded the highest number of youthful driver involvement in fatal crashes in 1983. These were equally divided between the two three-hour periods from 9 PM to midnight and midnight to 3 AM. The greatest percentage of total collision involvement (22.9%) for these drivers was from 3 PM to 6 PM (Figure 3-10). In the urban areas the greatest youthful involvement by time period in fatal collisions was divided between the two three-hour periods (3 PM to 6 PM) and (9 PM to midnight) each recording 18.7% of the days fatal crashes. The three hour period from midnight to 3 AM recorded 17.2% of the total. The 3 PM to 6 PM time period recorded 26.6% of the youthful drivers involved in total urban collisions (Figure 3-11).

Figure 3-10

Youthful Drivers Involved In Rural Area Fatal and Total Collisions — 1983 — By Hour Of Day

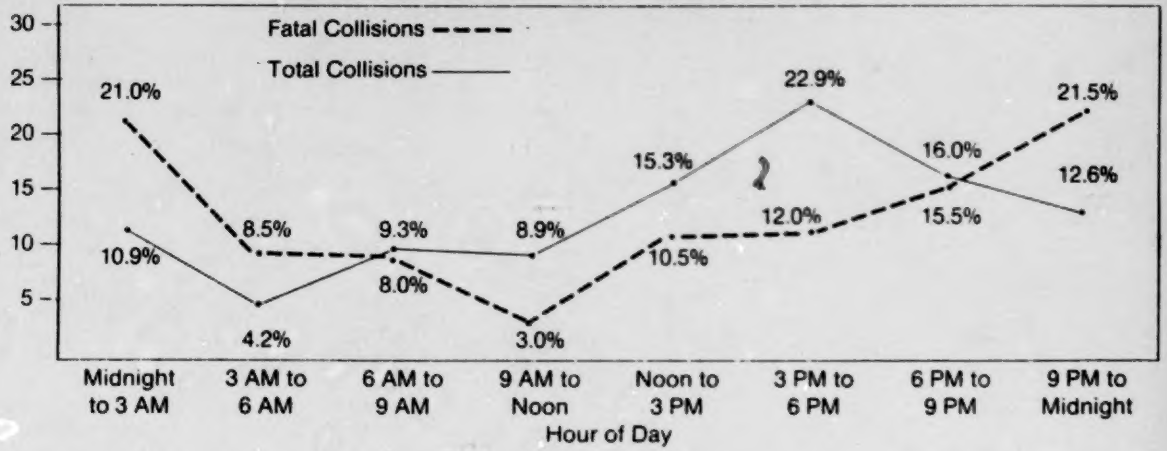
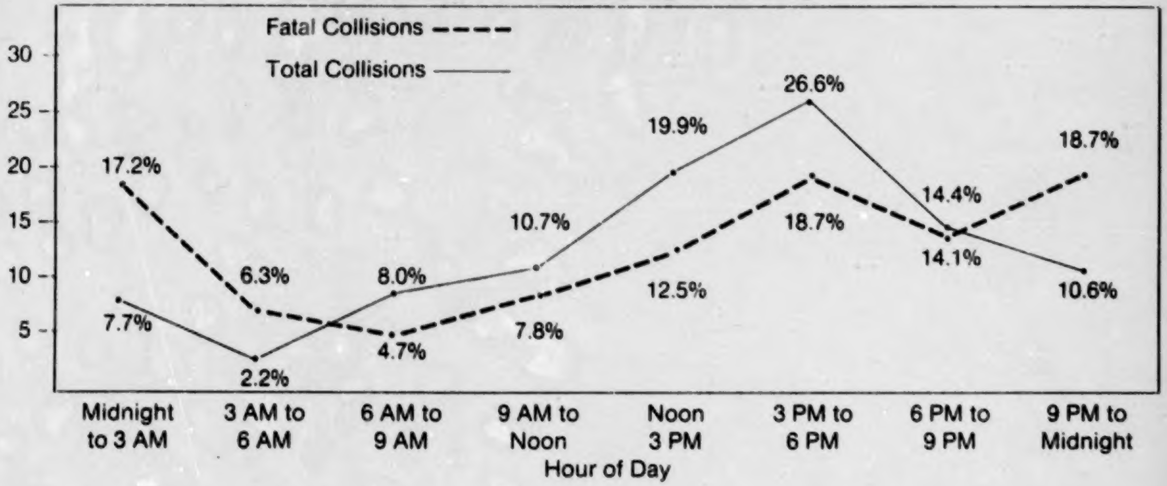


Figure 3-11

Youthful Drivers Involved In Urban Area Fatal and Total Collisions — 1982 — By Hour Of Day



SAFETY RESTRAINT USAGE

Overview

In 1983, out of a total of 151,421 occupants involved in total collisions, 31,751 were using safety restraints. This is a usage of 21.0% and marks an increase in safety restraint usage over 1982 (Table 4-1).

Table 4-1 **USAGE RATE**

	1983	%	1982	%	1981	%	1980	%	1979	%
Restraints Used	31,751	21.0%	24,797	17.8%	25,190	15.9%	27,018	17.4%	35,864	21.3%
No Restraints Used	119,670	79.0%	114,611	82.2%	132,921	84.1%	128,264	82.6%	132,888	78.7%
Total Occupants	151,421	100.0%	139,408	100.0%	158,111	100.0%	155,282	100.0%	168,752	100.0%

In 1983, 31,745 individuals out of a total of 151,384 accident involved occupants were using a restraining device. This represents a restraint usage percentage of 21.0%. Child restraints were used by 1,095 accidents involved children. (Table 4-2). Combining all restraint devices into usage or non-usage categories, it appears that with safety restraint usage, injuries were less likely to occur and those injuries that did occur were less severe. (Appendix C).

Table 4-2 **RESTRAINT USAGE AND INJURIES SUSTAINED***

	Restraints Used		Child Restraints**		No Restraints		Total Occupants	
	Number	%	Number	%	Number	%	Number	%
Deaths	42	0.13%	3	0.27%	416	0.35%	458	0.30%
Disabling Injuries	533	1.7%	8	0.7%	4,639	3.9%	5,172	3.4%
Evident Injuries	2,450	7.7%	73	6.7%	14,285	11.9%	16,735	11.1%
Possible Injuries	3,761	11.8%	87	7.9%	13,822	11.6%	17,583	11.6%
No Injuries	24,959	78.6%	924	84.4%	86,477	72.3%	111,436	73.6%
Totals	31,745	100.0%	1,095	100.0%	119,639	100.0%	151,384	100.0%

*Excludes cases where injury severity was not stated.
**Included with Restraints Used category

In 1983, 23.6% of the female drivers used their restraints while 22.0% of the male drivers used their restraints in collisions. Passengers had a lower usage rate at 18.9% for the females and 14.8% for the male passengers. The 0-5 age group had the highest restraint usage of any age group at 42.3% usage. The age group with the lowest usage rate was the 16 - 19 year olds at 14.0% usage (Table 4-3).

Table 4-3 **USAGE RATES BY SEX AND AGE GROUP — 1979 - 1983**

	Percent Used Restraints				
Occupant	1983	1982	1981	1980	1979
Male Driver	22.0	19.1	17.4	19.3	23.4
Female Driver	23.6	20.0	18.2	19.9	24.3
Male Passenger	14.8	11.2	9.9	10.6	13.9
Female Passenger	18.9	15.3	12.6	13.5	16.4
Age 0-5	42.3	32.2	26.1	24.0	24.4
Age 6-15	14.8	11.5	9.6	9.7	12.5
Age 16-19	14.0	11.5	11.7	12.0	15.7
Age 20-24	16.3	14.3	13.4	14.8	18.7
Age 25-34	23.0	19.6	17.5	19.4	23.0
Age 35-64	23.3	22.2	20.3	22.3	26.5
Age 65 & Up	21.4	18.3	19.5	18.0	25.7

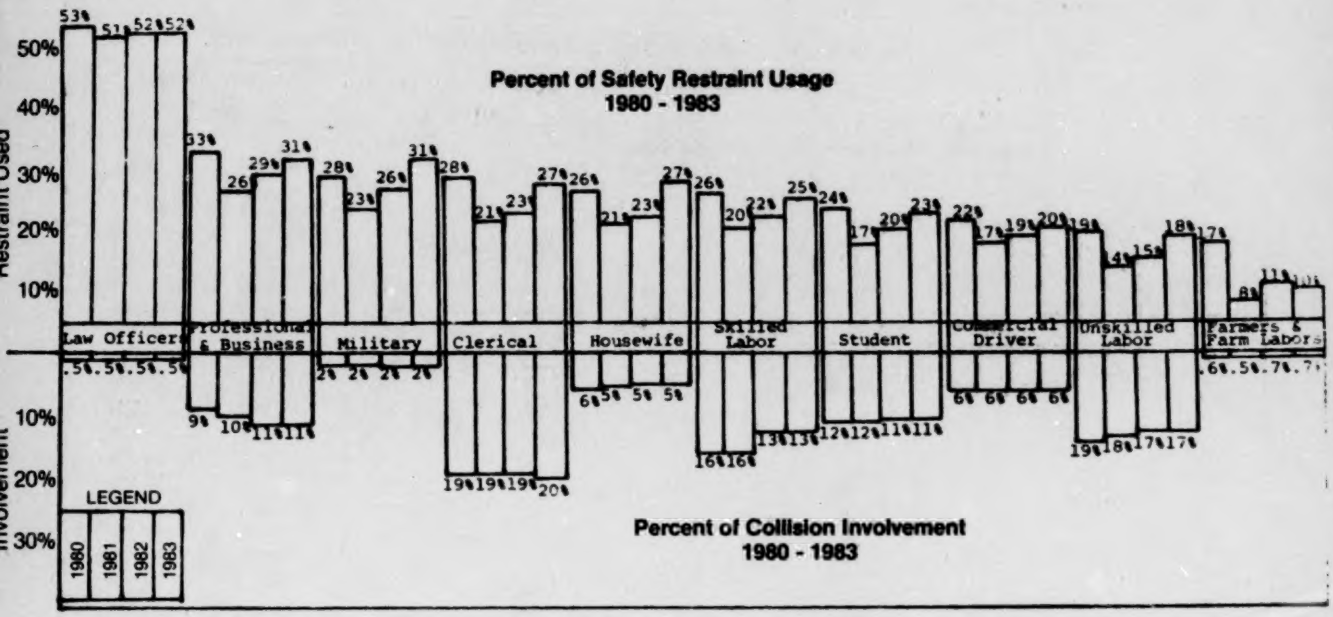
Viewing restraint usage by age in 1983, the 0-1 age group had the highest usage rate, 61.7%. The lowest rate of restraint usage was for the 14 year old occupants, they had a usage rate of 11.7%. It should be noted that every age group had a higher reported usage rate in 1983 except the 12 year olds. The largest gain in restraint usage was in the four year old and younger group. (Table 4-4). This table also depicts the type of restraint used by each age group. Child restraints are the most commonly used restraint device up to the age of three after which either lap belts or a lap and shoulder belt were the most common restraint device used.

Table 4-4 **1983 SEAT BELT USAGE BY OCCUPANT AGE**

						Total Restraints Used		Restraints Not Used	
Age	**Lap Belt**	**Shoulder Belt**	**Lap & Shoulder Belt**	**Child Retraint**	**Air Bag Activated**	**Number**	**% of Total**	**Number**	**% of Total**
0 - 1	75	10	68	564	0	717	61.7%	446	38.3%
2	103	3	45	244	1	396	43.0%	525	57.0%
3	124	4	70	105	0	303	37.0%	517	63.0%
4	144	7	70	47	0	268	33.2%	539	66.8%
5	95	6	57	21	0	179	26.0%	509	74.0%
6	94	3	28	7	0	132	23.3%	434	76.7%
7	65	3	32	2	1	103	20.1%	410	79.9%
8	54	2	33	0	0	89	16.7%	443	83.3%
9	46	3	37	0	0	86	17.8%	397	82.2%
10	40	1	34	0	0	75	15.0%	424	85.0%
11	45	3	34	0	0	82	15.4%	450	84.6%
12	54	6	33	0	0	93	13.2%	610	86.8%
13	54	2	49	0	0	105	13.5%	674	86.5%
14	58	5	62	0	0	125	11.7%	945	88.3%
15	119	8	97	0	0	224	12.5%	1,570	87.5%
16	380	39	419	0	1	839	15.9%	4,425	84.1%
17	441	44	413	0	1	899	14.2%	5,434	85.8%
18	461	35	409	0	2	907	13.1%	6,024	86.9%
19	394	59	397	0	1	851	13.4%	5,512	86.6%
20	418	39	422	0	0	879	14.5%	5,175	85.5%
21 - 24	1,385	194	1,866	0	6	3,451	16.8%	17,105	83.2%
25 - 29	1,545	241	2,332	0	6	4,124	21.4%	15,124	78.6%
30 - 64	5,182	842	7,889	0	15	13,928	25.1%	41,644	74.9%
65 & Over	951	123	1,037	0	3	2,114	23.6%	6,856	76.4%
Age Unknown	180	29	200	34	2	445	15.0%	2,523	85.0%
TOTAL	12,507	1,711	16,109	1,039	39	31,405	20.9%	118,713	79.1%

The usage rate of safety restraints by occupation of driver ranges from a high of 51.8% for law officers to a low of 9.9% for farmers and/or farm labor. Usage rates for all occupations, with the exception of farm labor, recorded increases in 1983 after experiencing low usage rates in 1981 (Figure 4-1).

Figure 4-1 Collision Involvement and Safety Restraint Usage By Driver Occupation
1980 - 1983



Freeway travel (interstates and other controlled access routes) had the highest usage rate by vehicle occupants at 27.4%. Occupants of vehicles traveling on county roads had the lowest recorded usage rate at 17.7% (Table 4-5).

Table 4-5 RESTRAINT USAGE BY FUNCTIONAL CLASS OF ROADWAY BY YEAR

Functional Class	1983	1982	1981	1980
Interstate and limited access	27.4%	29.0%	25.3%	29.4%
Other state routes	21.1%	17.8%	16.2%	21.4%
County roads	17.7%	15.0%	13.7%	18.7%
City streets	20.1%	16.3%	14.9%	21.4%
All others	19.8%	16.6%	16.6%	21.3%

Examining safety restraint usage by vehicle type, the passenger car had the highest reported usage rate, 22.4%. All types of vehicles recorded increases in their usage rate the past two years, however, only one, the light trucks, have reached the usage rate recorded in 1980 (Table 4-6).

Table 4-6 SEAT BELT USAGE RATE BY TYPE OF VEHICLE DRIVERS 1980 - 1983

Type of Vehicle	1983	1982	1981	1980
Passenger car	22.4%	19.0%	17.2%	22.8%
Light trucks (under 10,000 gross)	16.2%	13.0%	11.2%	16.1%
Heavy trucks (10,000 gross & over)	16.0%	15.2%	13.9%	18.4%
All others	21.5%	22.1%	15.0%	23.0%

On September 29, 1981, Governor John Spellman issued a directive that safety restraint usage was mandatory in all state vehicles. In 1983, of all state vehicles involved in collisions, 60.0% of the occupants were using restraints. This is down 5% from the preceding two year period when the usage rate reached 65.0%. The next highest government agency reporting was "Other" (federal government agencies) at 54.2% usage, a substantial increase from the 44.4% rate of the previous year. County government vehicles had the lowest reported usage rate at 32.3% (Table 4-7).

Table 4-7

SEAT BELT USAGE RATE BY TYPE OF GOVERNMENT VEHICLES
1980 - 1983

Type of Government Vehicle	1983	1982	1981	1980
State registered vehicles	60.0%	65.0%	65.0%	46.0%
County registered vehicles	32.3%	37.3%	30.1%	39.7%
Municipal registered vehicles	35.1%	28.1%	27.7%	30.9%
Other government registered vehicles	54.2%	44.4%	39.2%	50.0%

Out-of-state drivers had the highest reported usage rate at 28.6%, followed by drivers who were over 15 miles from their residence with a 23.7% usage rate. Local drivers, living within 15 miles of the accident scene were using restraints 22.1% of the time. All categories showed improvements in the usage rate over the past two years (Table 4-8).

Table 4-8

SEAT BELT USAGE RATE BY PROXIMITY OF DRIVER RESIDENCE
1980 - 1983

Residence Proximity	1983	1982	1981	1980
Resided within 15 miles of collision	22.1%	18.9%	17.3%	23.7%
Resided over 15 miles	23.7%	21.2%	19.3%	24.3%
Residing in other state	28.6%	24.4%	22.4%	29.3%

In examining restraint usage by seat position, drivers (left front) were the most frequent users of restraining devices, 22.5% during 1983, up from the 19.3% usage rate for 1982, but down slightly from the 1980 rate. The next most frequent users were those occupants riding in the left and right back, respectively. These positions, which include the greatest usage of child restraints, both were near the 22% usage, much above the previous three years' usage. The seat position where reported usage was the least, was the front middle at 10.6% (Table 4-9).

Table 4-9

RESTRAINT USAGE BY OCCUPANT SEAT POSITION

Occupants	1983	1982	1981	1980
Driver	22.5%	19.3%	17.7%	24.0%
Mid-front	10.6%	7.6%	7.2%	9.6%
Right front	17.0%	14.3%	12.4%	17.0%
Left back	22.2%	16.4%	12.6%	14.3%
Mid-back	14.9%	11.0%	7.7%	10.8%
Right-back	21.9%	16.2%	12.4%	14.4%
Other	4.8%	3.8%	2.7%	2.6%
TOTAL	21.0%	17.8%	16.0%	21.5%

Further examining restraint usage by seat position for age, Table 4-10 presents the usage by age group. The right back and left back, respectively, for the 0 - 4 age group had the highest reported usage rates at over 60%. Lowest reported usage rates for the 0 - 4 age group were in the "other" position (rear end of station wagons or vans) at 12.8%. For the 5-9 age group, the most frequent safety restraint usage also occurred in the left back and right back seat positions, 28.7% and 27.2%. The right front seat position recorded a usage rate of 21.7%. The 10-14 age group had its greatest reported restraint usage occur in the right front and right back seat positions, 16%. The driver's position had the greatest reported usage rate for all the other age groups, ranging from a 26.1% usage rate for the 30-64 year old group to a low of 16.7% for drivers 15 to 20 years of age.

The positions with the lowest reported usage rate were the mid-front and mid-back seat position reporting 2.5% and 3.5% for the 15-20 age group. This held true for all age groups with the exceptions of the 65 and over age group where the mid-back and right back reported the lows with 8.7% and 10.6% respectively.

Table 4-10 **RESTRAINT USAGE BY OCCUPANT AGE AND SEAT POSITION**
1983

Seat Position	0 - 4	5 - 9	10-14	15-20	21-24	25-29	30-64	65 & Over
Driver	—	—	—	16.7%	18.8%	22.9%	26.1%	24.4%
Mid-front	31.3%	10.2%	4.6%	2.5%	6.6%	8.2%	9.2%	15.7%
Right-front	39.6%	21.7%	16.1%	10.9%	12.6%	15.9%	21.1%	23.1%
Left-back	60.3%	28.7%	14.6%	8.9%	6.8%	10.7%	12.4%	16.2%
Mid-back	39.3%	14.5%	6.8%	3.5%	6.3%	6.3%	10.9%	8.7%
Right-back	66.6%	27.2%	16.0%	7.5%	8.6%	14.0%	16.0%	10.6%
Other	12.8%	6.7%	2.5%	0.9%	0%	0%	7.3%	9.1%
Seat Location Unknown	22.8%	11.7%	3.5%	0.9%	2.4%	7.5%	6.1%	6.3%

Table 4-11 presents a more detailed breakdown of injury severity by type of restraint used. It should be noted that only 42 of the 458 deaths happened to occupants using their restraints. Of the 5,172 individuals sustaining disabling injuries from collisions, 533, or about 1 in 10, were using restraints.

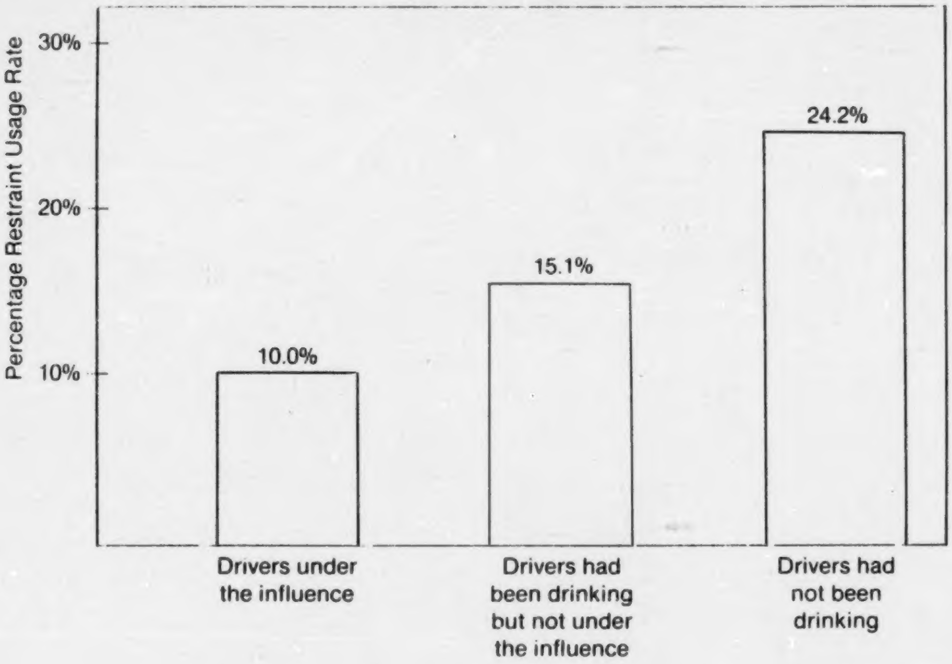
Table 4-11 **TYPES OF RESTRAINTS USED BY SEVERITY OF INJURY — 1983**

	Number Used		Deaths		Disabling Inj.		Evident Injury		Possible Injury		No Injury	
Type	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Lap Belt	12,656	8.4	17	3.7	193	3.7	976	5.8	1,359	7.7	10,111	9.1
Shoulder Belt	1,722	1.1	1	0.2	23	0.4	134	0.8	204	1.2	1,360	1.2
Lap & Shoulder Belt	16,234	10.7	21	4.6	308	6.0	1,264	7.6	2,111	12.0	12.530	11.2
Child Restraint	1,095	0.7	3	0.7	8	0.2	73	0.4	87	0.5	924	0.8
Air Bag (Activated)	38	*	0	0.0	1	*	3	*	0	0.0	34	*
No Restraints	119,639	79.0	416	90.8	4,639	89.7	14,285	85.4	13,822	78.6	86,477	77.7
Total Occupants	151,384	100.0	458	100.0	5,172	100.0	16,735	100.0	17,583	100.0	111,436	100.0

*Less Than 1/10 of 1 percent.

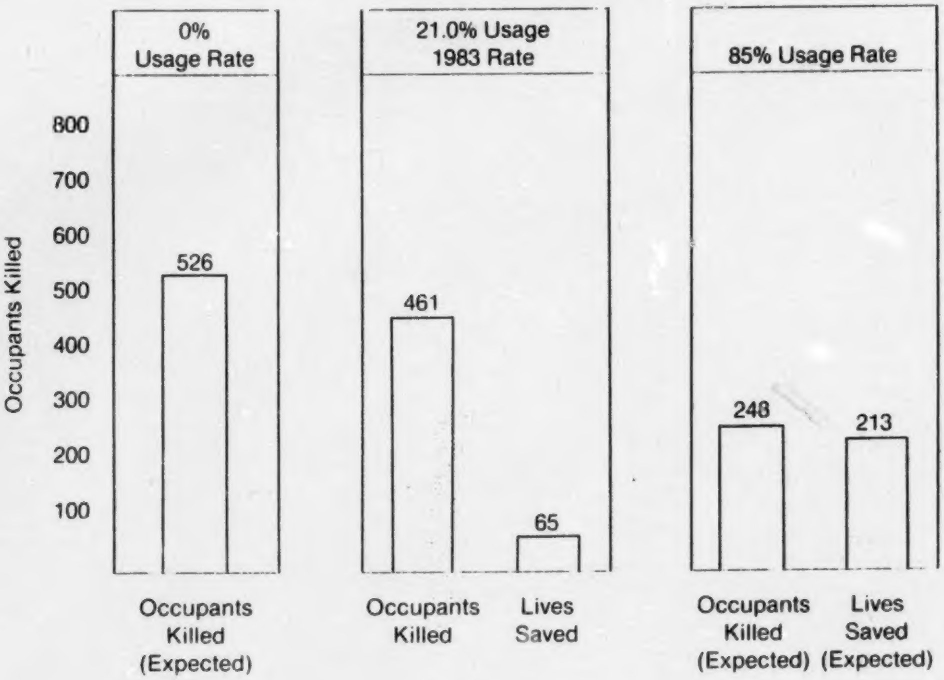
Among drivers who had been drinking, there was a greater tendency not to use restraints than among drivers who had not been drinking. Of the drivers involved in collisions in 1983, only 10% of those who were under the influence used their safety belt. Thirteen point five percent of the drivers who had been drinking but were not under the influence used their safety restraints while 24.2% of the drivers who had not been drinking used their restraints. (Figure 4-2).

Figure 4-2 **Restraint Usage By Sobriety**



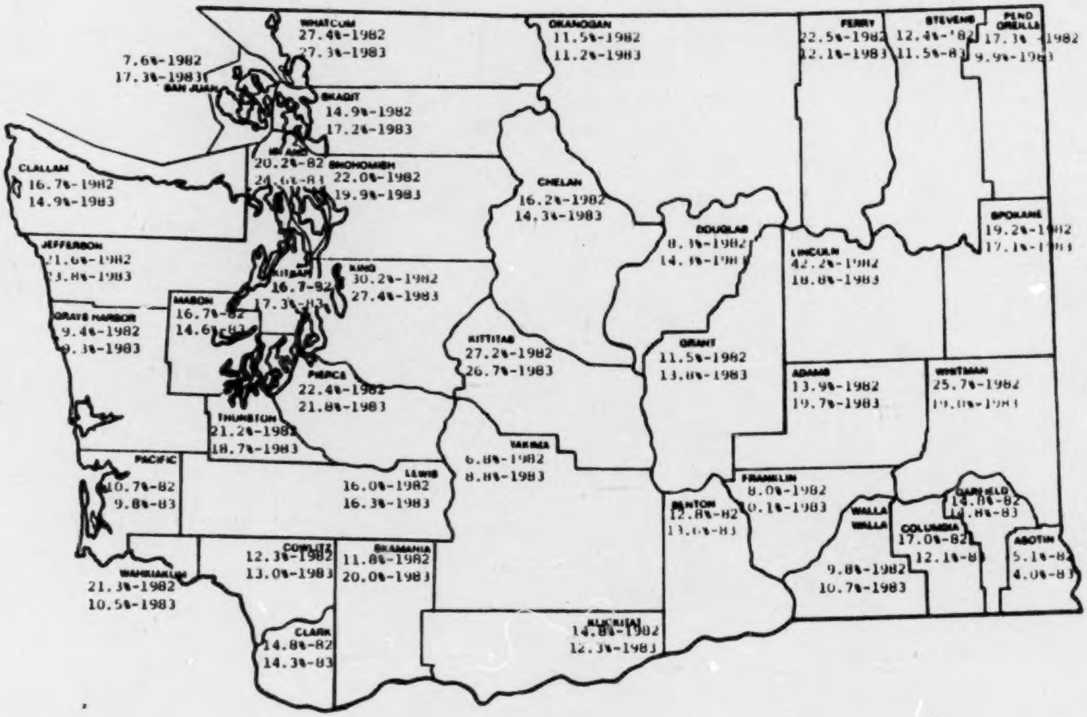
Based on the data that was obtained for restraint usage and the number of fatalities occurring in 1983, it is possible to project the number of fatalities that would have occurred under varying restraint usage rates (Figure 4-3). The center portion of the figure depicts the situation that existed in 1983. Occupant restraint devices were used by 21.0% of the occupants involved in crashes. At this usage rate there were 461 fatalities. Based on this information, it is estimated that 65 lives were saved by restraint usage. The left side of the figure presents the situation that could have been expected to exist if no restraints were used. Assuming that the usage rate among vehicle occupants could be brought up to the 85% level, it is projected that there would have been 248 fatalities and 213 more lives would have been saved. Clearly, based on this projective technique, the higher the usage rate, the greater the savings in lives. (Appendix C for computation)

Figure 4-3 **Occupant Restraints Usage in Fatal Crashes**



A graphic depiction of restraint use by county is presented in Figure 4-4. King County had the highest usage rate of all counties in the state at 27.4%, down slightly from the 30.2% rate of the previous year. Whatcom County had the second highest usage rate at 27.3%, nearly identical to the 1982 rate. The county with the lowest usage rate was Asotin County at 4.0% usage, down from the 5.1% rate of a year ago.

Figure 4-4 **Seat Restraint Usage Rate By County — 1982/83**


WHATCOM
27.4%-1982
27.3%-1983
7.6%-1982
17.3%-1983
SAN JUAN
SKAGIT
14.9%-1982
17.2%-1983
ISLAND
20.2%-82
24.6%-83
SNOHOMISH
22.0%-1982
19.9%-1983
CLALLAM
16.7%-1982
14.9%-1983
JEFFERSON
21.6%-1982
23.8%-1983
KITSAP
16.7-82
17.3%-83
KING
30.2%-1982
27.4%-1983
MASON
16.7%-82
14.6%-83
GRAYS HARBOR
9.4%-1982
9.3%-1983
PIERCE
22.4%-1982
21.8%-1983
THURSTON
21.2%-1982
18.7%-1983
PACIFIC
10.7%-82
9.8%-83
LEWIS
16.0%-1982
16.3%-1983
WAHKIAKUM
21.3%-1982
10.5%-1983
COWLITZ
12.3%-1982
13.0%-1983
SKAMANIA
11.8%-1982
20.0%-1983
CLARK
14.8%-82
14.3%-83
OKANOGAN
11.5%-1982
11.2%-1983
CHELAN
16.2%-1982
14.3%-1983
KITTITAS
27.2%-1982
26.7%-1983
YAKIMA
6.8%-1982
8.8%-1983
KLICKITAT
14.8%-1982
12.3%-1983
DOUGLAS
8.3%-1982
14.3%-1983
GRANT
11.5%-1982
13.8%-1983
BENTON
12.8%-82
13.6%-83
FRANKLIN
8.0%-1982
10.1%-1983
FERRY
22.5%-1982
12.1%-1983
STEVENS
12.4%-'82
11.5%-83
PEND OREILLE
17.3% -1982
9.9%-1983
SPOKANE
19.2%-1982
17.1%-1983
LINCOLN
42.2%-1982
18.8%-1983
ADAMS
13.9%-1982
19.7%-1983
WHITMAN
25.7%-1982
19.0%-1983
WALLA WALLA
9.8%-1982
10.7%-1983
COLUMBIA
17.0%-82
12.1%-83
GARFIELD
14.8%-82
14.8%-83
ASOTIN
5.1%-82
4.0%-83

1983
21.0% & Greater — 6
15.0% — 20.9% — 11
14.9% & Under — 22

STATE OF WASHINGTON
STATEWIDE USAGE RATE 17.9%-1982
21.0%-1983

MOTORCYCLE COLLISIONS

Overview

In 1983, motorcycle fatal, injury and total collisions decreased 30.0%, 11.9%, and 11.8% respectively when compared to the previous 4-year baseline average. Registration in 1983 totaled 127,950 motorcycles, a decrease of 4.7% over the baseline period. The motorcycle collision rate of 2.59 for 1983 decreased 7.2% from the baseline rate of 2.79 motorcycle collisions per every 100 registered.

Table 5-1 **MOTORCYCLE COLLISIONS 1979 — 1983**

	1979	1980	1981	1982	Previous 4 Year Average	1983	Change 83-4 Yr. Average
Total Collisions	3,992	3,914	3,728	3,376	3,753	3,312	-11.8%
Fatal Collisions	116	116	104	103	110	77	-30.0%
Fatal Collisions Ratio (Fatal Collisions per 1,000 motorcycle coll.)	29.1	29.6	27.9	30.9	29.3	23.2	+20.8%
Fatal Registration Rate (Fatal Collisions per 1,000 motorcycles reg.)	.895	.854	.743	.782	.819	.602	-26.5%
Injury Collisions	3,471	3,373	3,186	2,867	3,224	2,839	-11.9%
Motorcycle Registration	129,641	135,899	139,931	131,667	134,285	127,950	- 4.7%
Total Collision Registration Rate (Motorcycle involved per 100 registered)	3.08	2.88	2.66	2.56	2.79	2.59	- 7.2%

MOTORCYCLE COLLISIONS BY LOCATION

A breakdown by type of motorcycle collision by rural, urban and statewide totals for 1983 indicates 52.9% of the total collisions and 52.0% of the injury collisions occurred in urban areas, while 61% of the fatal collisions occurred in rural areas (Table 5-2).

Table 5-2 **MOTORCYCLE COLLISION DATA**

	1983			1982		
	Urban	Rural	Statewide	Urban	Rural	Statewide
Total Collisions	1,752	1,560	3,312	1,816	1,560	3,376
Fatal Collisions	30	47	77	34	69	103
Total Fatalities	30	47	77	36	73	109
Injury Collisions	1,475	1,364	2,839	1,521	1,346	2,867
Property Damage Only, Collisions	247	149	396	261	145	406
All Persons Injured	1,815	1,740	3,555	1,838	1,700	3,341
Motorcyclists Killed	30	47	77	36	72	108
Motorcyclists Injured	1,704	1,647	3,351	1,697	1,592	3,289

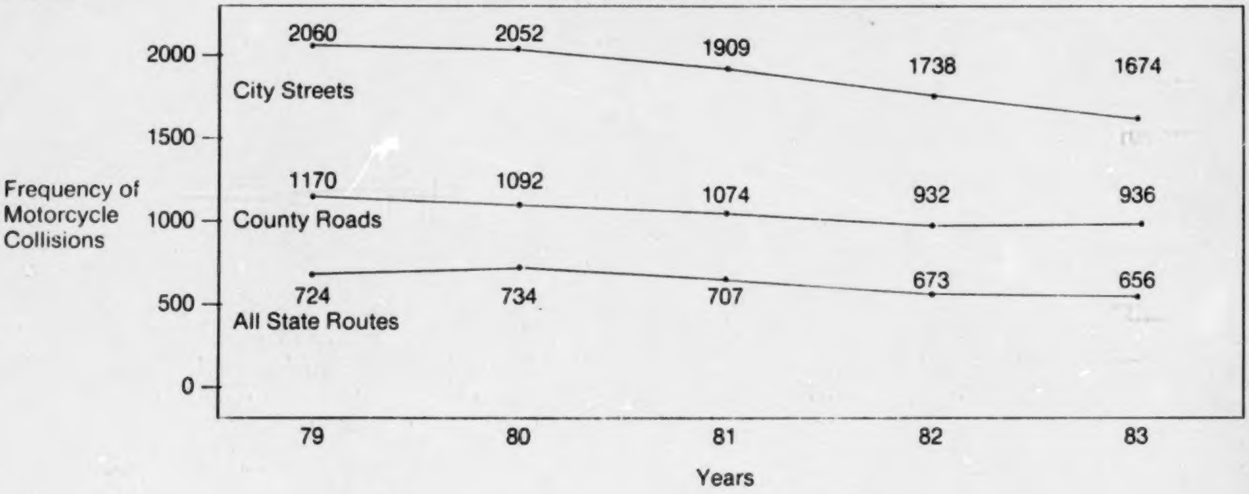
A further delineation of 1983 motorcycle collisions by road type indicates approximately 50.5% of the total collisions, 49.7% of the injury collisions and 32.5% of the fatal accidents occurred on city streets. About 29% of the injury collisions and 28% of the total collisions and 35.1% of the fatal collisions happened on county roads. State routes recorded 19.7% of the injury and 19.8% of the total collisions and 31.2% of the fatal motorcycle collisions (Table 5-3).

Table 5-3 **LOCATION OF MOTORCYCLE COLLISIONS — 1983**

State Routes	Total Collisions	Fatal Collisions	Injury Collisions	P.D. Only Collisions	Motor-cyclist Killed	Motor-cyclist Injured
Interstate System	170	6	145	19	6	164
Other Full Control	47	3	38	6	3	44
U.S. Rt. No. (excluding city streets)	82	3	73	6	3	87
State Rt. No. (excluding city streets)	357	12	303	42	12	375
County Roads	936	27	829	80	27	996
City Streets (including U.S. and State Rt. in cities)	1,674	25	1,412	237	25	1,639
Other Traffic Ways	46	1	39	6	1	46
TOTAL	3,312	77	2,839	396	77	3,351

Total frequency of motorcycle collisions occuring on city streets and state highways decreased during 1983. County roads recorded a slight increase. The decreases follow a three year trend on city streets and state routes (Figure 5-1).

Figure 5-1 **Location of Motorcycle Accidents By Year**



MOTORCYCLE COLLISIONS BY AGE GROUP

The younger the motorcycle rider, the greater the over-representation in the accident population compared to the percentage of licensed motorcycle drivers comprising that age group. This trend holds until the drivers reach the 25-29 year old age group, at which point they become under- represented in the motorcycle accident population. In 1983, over 75.3% of all fatal, and over 70% of all injury and total motorcycle collisions involved drivers under 30 years of age (Table 5-4).

Table 5-4

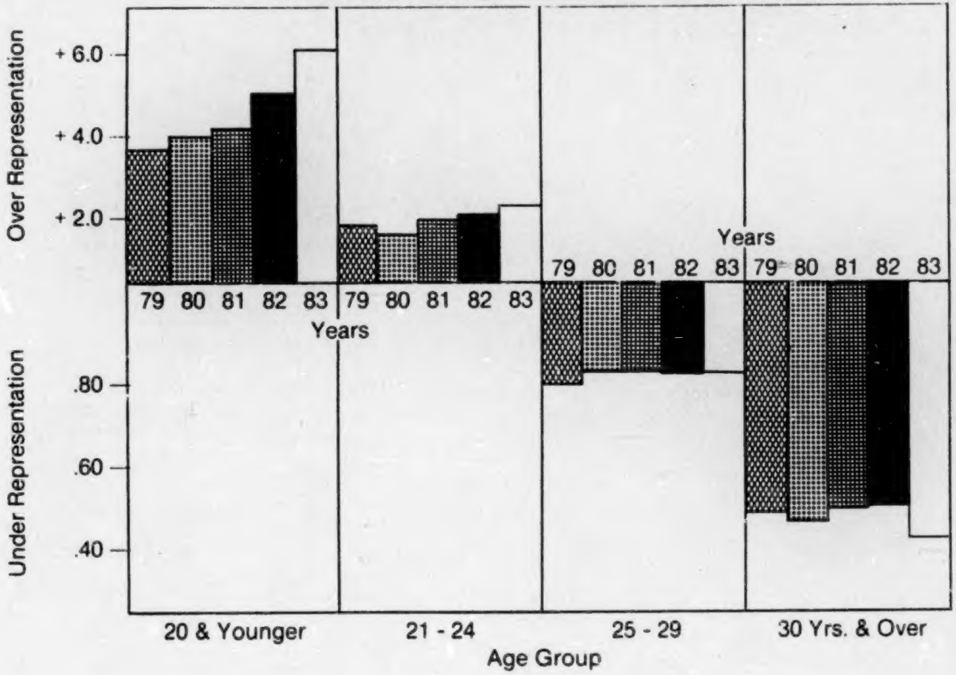
COMPARISON OF MOTORCYCLE RIDERS INVOLVED IN COLLISIONS TO NUMBER LICENSED IN 1983

	Motorcyclist Involved In:						Percent of Licensed Driver	Over/Under Representation
	Fatal Collisions		Injury Collisions		Total Collisions			
	No.	% of Total	No.	% of Total	No.	% of Total		
Under 16	2	2.60%	65	2.31%	67	2.09%	—	—
16	2	2.60	62	2.20	67	2.09	0.13%	16.08
17-18	6	7.79	285	10.13	318	9.94	1.28	7.77
19-20	13	16.88	382	13.57	443	13.84	3.21	4.31
21-22	6	7.79	379	13.47	435	13.59	5.03	2.70
23-24	8	10.39	285	10.13	328	10.25	6.43	1.59
25-29	21	27.27	518	18.41	592	18.50	22.16	.83
30-34	11	14.29	346	12.30	393	12.28	20.93	.59
35-39	3	3.90	204	7.25	226	7.06	14.69	.48
40-44	2	2.60	118	4.19	132	4.13	8.92	.46
45-54	0	—	106	3.77	127	3.97	10.21	.39
55-64	1	1.30	52	1.84	57	1.78	5.16	.34
65 and over	0	—	12	0.43	15	0.47	1.85	.25

Collapsing the under 30 years of age motorcycle riders into three groups and comparing 1983 accident data to the 1979-1982 baseline period, the 20 and younger age group showed the greatest over-representation in total motorcycle accident involvement when compared to the percentage of licensed motorcycle riders comprising that age group. The amount of over-representation, within this group, has increased each of the last five years. The 21-24 year old age group was over-represented, though not to the extent of the 20 and younger group. The 21-24 year old group has been increasing the degree of its over-representation annually since 1979, despite a slight drop in 1980. The 25-29 year old and the 30 year old and older age groups are under-represented in total collisions compared to percentage of licensed motorcycle riders these age groups comprise. The under-representation within these groups has been consistent throughout the baseline period. In 1983, the amount of under-representation remained constant when compared to the previous year for the 25-29 age group. The 30 years & over group has remained fairly constant from 1979 thru 1982. However, in 1983 the under-representation ratio decreased slightly for this age group (Figure 5-2).

Figure 5-2

Comparison of Motorcycle Driver Over/Under Representation Collisions to Motorcycle Endorsement by Age Group 1979-1983



PRINCIPAL VIOLATIONS IN ACCIDENTS BY AGE GROUPS

Speed too fast for conditions was the principal cause of motorcycle collisions for all age groups, contributing to 22.7% of the 1983 motorcycle violations. Motorcyclist driving while intoxicated was the second most predominate violation contributing to 12.7% of the total. Speed over the legal limit was the third leading violation contributing to 11.7% of all motorcycle driver violations (Table 5-5).

Table 5-5 **MOTORCYCLIST VIOLATIONS BY AGE — 1983**

(Investigated Collisions Only)

Violation	Total Viol.	% of Total	AGE OF VIOLATOR 20 & Under	21 24	25 29	30 34	35 44	45 54	55 & Over	Not Stated
Speed — Conditions	514	22.7	160	111	97	63	48	16	8	11
Speed — Over Legal	265	11.7	108	66	43	17	24	3	0	4
Failed to Yield	149	6.6	69	29	14	12	12	2	3	8
D.W.I.	287	12.7	52	82	70	47	23	7	1	5
Following Too Closely	97	4.3	35	21	14	10	14	1	2	0
Improper Passing	154	6.8	49	36	37	9	7	9	3	4
Operating Defective Equipment	152	6.7	61	32	31	11	13	2	0	2
Disregard Signs/ Signals	93	4.1	30	21	18	8	10	0	0	6
Over Centerline	52	2.3	22	10	6	7	2	4	0	1
Other Violations	501	22.1	147	108	82	63	50	20	20	11
TOTAL	2,264	100%	733	516	412	247	203	64	37	52

MOTORCYCLE COLLISIONS BY FIRST HARMFUL EVENT

In 1983 the most common first harmful event causing a single motorcycle collision was overturning. This cause held for all age groups. In multiple vehicle collisions involving motorcycles the angular collision was most prevalent condition (15.9%). Rear-end collisions was the next most common event for multiple vehicle motorcycle collisions at 14.5% of the total (Table 5-6).

Table 5-6 **MOTORCYCLE COLLISIONS BY FIRST HARMFUL EVENT — 1983**

Type of Collision (First Harmful Event)	Total All	% of Total	Age of Motorcyclist 20 & Under	21 24	25 29	30 34	35 44	45 54	55 & Over
Single Motorcycle Coll:									
Struck Fixed Object	381	11.9%	107	89	79	55	32	10	9
Struck Other Object	19	0.6%	5	9	3	1	1	0	0
Overturned	735	23.1%	166	177	140	101	98	35	18
Motorcycle-Pedestrian	17	0.5%	7	4	2	3	1	0	0
Motorcycle-R.R. Train	0	—	0	0	0	0	0	0	0
Motorcycle-Pedalcyclist	17	0.5%	3	4	4	3	2	1	0
Motorcycle-Animal	65	2.0%	15	7	14	11	12	4	2
Non-Collision	30	0.9%	6	7	5	5	5	1	1
Total Single Motorcycle Coll's.	1,264	39.5%	309	297	247	179	151	51	30
Multiple Vehicle Coll:									
Head-on	48	1.5%	21	7	9	2	5	3	1
Rear-End	465	14.5%	130	97	86	59	58	18	17
Sideswipe	158	4.9%	42	41	33	15	18	6	3
Angular Direction	507	15.9%	180	128	86	46	48	14	5
Enter/Leave Driveway	401	12.5%	115	97	72	48	37	19	13
One Left/One Straight-Opp. Dir.	223	7.0%	65	59	34	28	24	10	3
Other Multiple Vehicle Coll.	134	4.2%	33	37	25	16	17	6	0
Total Multiple Vehicle Coll.	1,936	60.5%	586	466	345	214	207	76	42
TOTAL MOTORCYCLE COLL.	3,200	100.0%	895	763	592	393	358	127	72

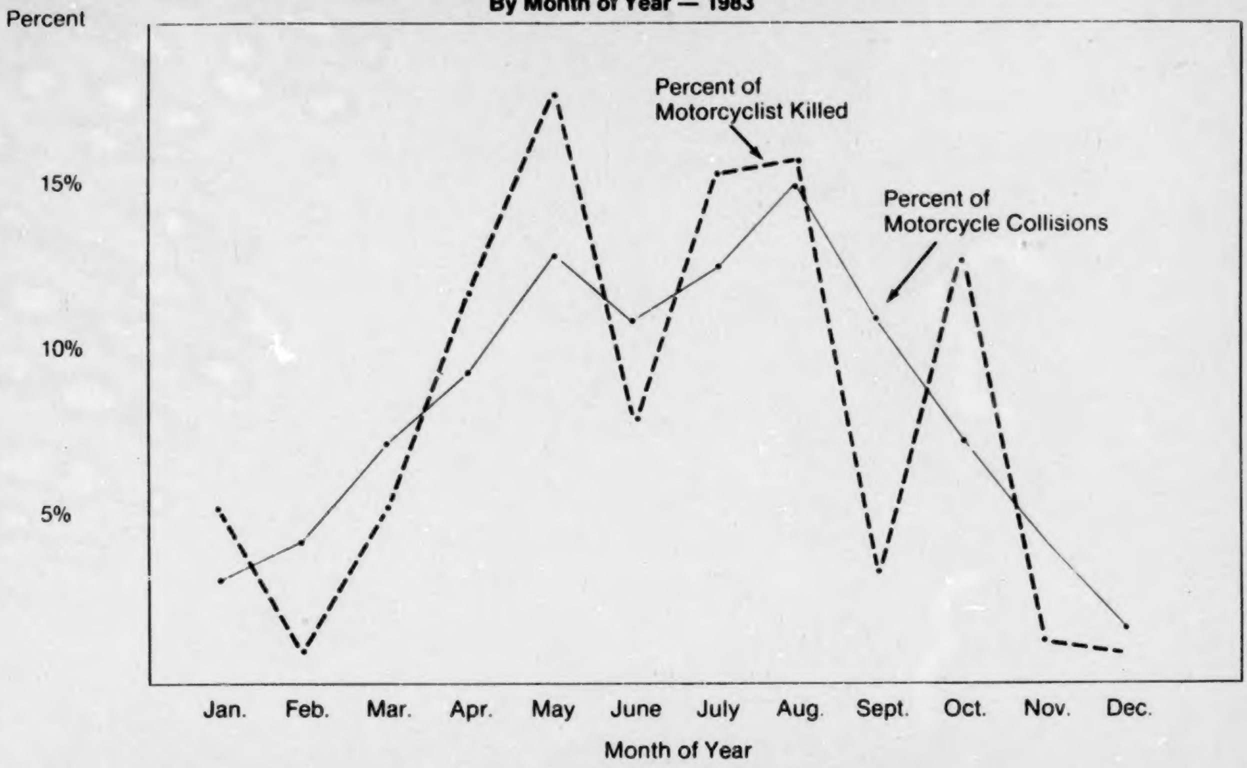
*Less than 1/10th of one percent

TIME OF MOTORCYCLE ACCIDENT OCCURRENCE

The warmer weather months (May-Sept.) of 1983 saw the greatest frequency of motorcycle collisions and fatalities (Figure 5-3)

Figure 5-3

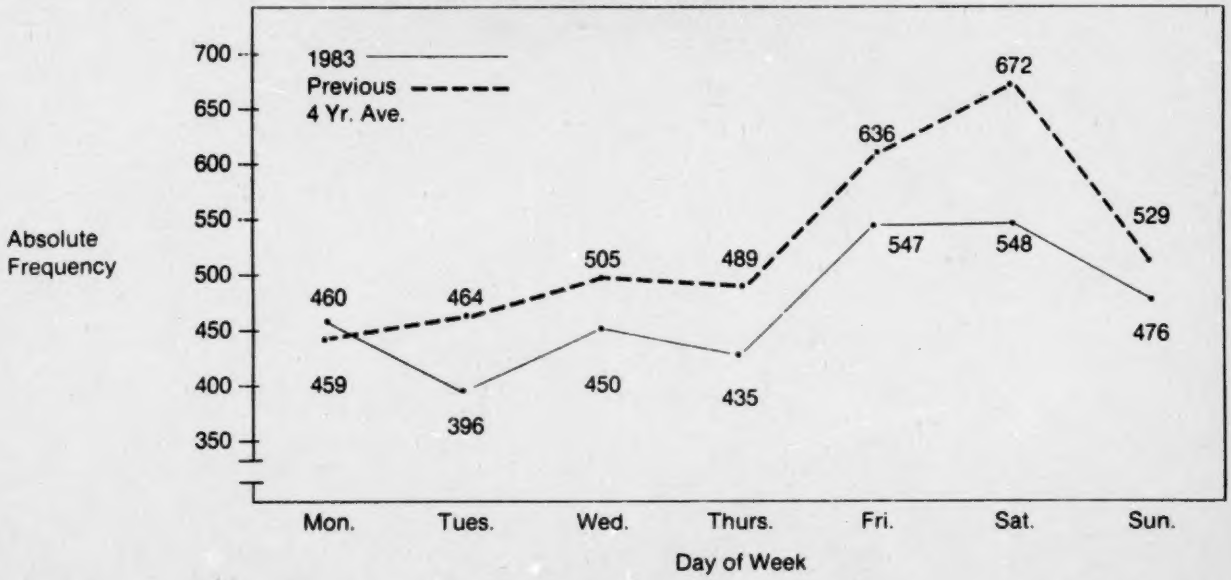
Comparison of Motorcycle Collisions and Fatalities By Month of Year — 1983



In comparing the frequencies of motorcycle collisions by day of week, Friday and Saturday are seen as the two days with the highest rate of occurrence. This trend has been consistent throughout the four year baseline period and continued in 1983 as well. In 1983, total motorcycle collisions were down 11.8% over the average of the baseline period (Figure 5-4).

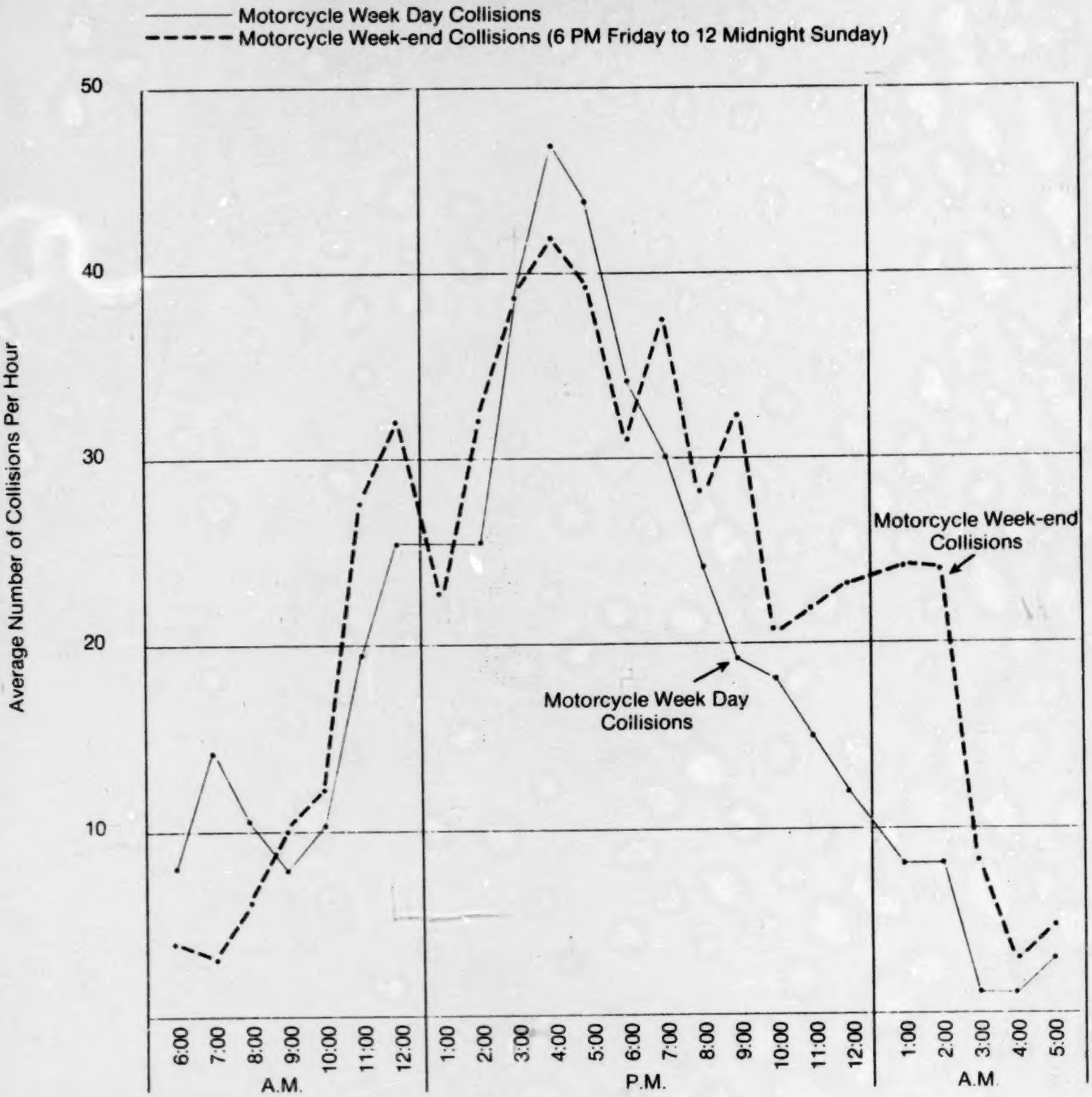
Figure 5-4

Frequency of Motorcycle Collisions by Day of Week Over the Period 1983 & Previous 4 Year Ave.



A further breakdown by hour of day when collisions were occurring in 1983 revealed the late afternoon (3 PM) to the early evening (8 PM) to be the worst period of the day. This finding was consistent for both weekdays and weekends. The weekends, additionally, had an extended high average frequency of collisions into the early morning hours (Figure 5-5).

Figure 5-5 Average Number of Motorcycle Collisions by Hour of Day on Weekdays, Weekends and Weeklong in 1983



PEDALCYCLES

Overview

In 1983, total pedalcycle accidents were up 15.1% over the previous four-year baseline period. The number of pedalcyclists killed increased 7.7% from the baseline period. The number of individuals injured was up 15.9% in 1983 (Table 6-1).

Table 6-1

PEDALCYCLE TRAFFIC COLLISIONS
1979 — 1983

	1979	1980	1981	1982	Previous 4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
Total Collisions	1,041	1,097	1,083	1,056	1,069	1,230	+ 15.1%
Persons Killed	14	11	20	8	13	14	+ 7.7%
Persons Injured	1,071	1,125	1,094	1,078	1,092	1,266	+ 15.9%

RURAL — URBAN PEDALCYCLE ACCIDENTS

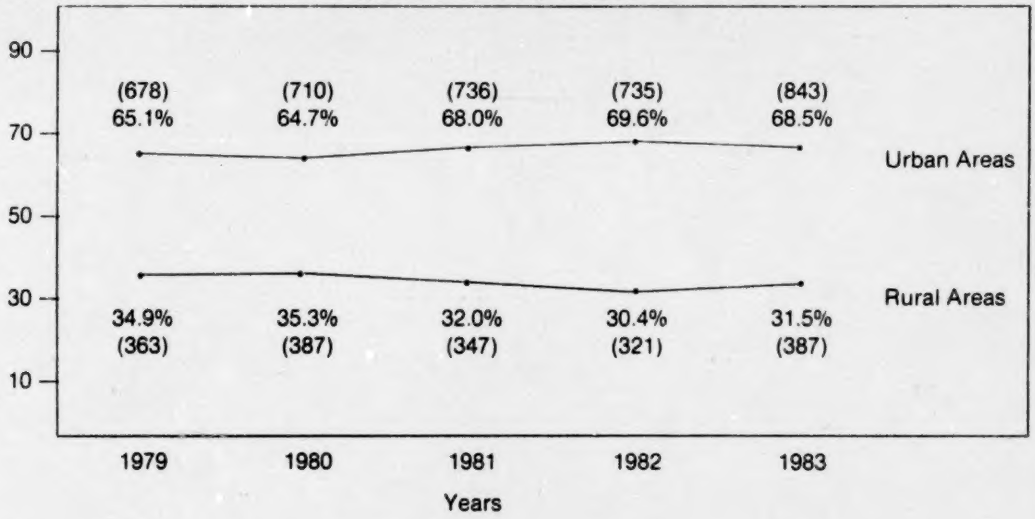
Total pedalcycle collisions in 1983 were up 9.3% in rural areas and up 17.9% in urban areas compared to a four-year baseline period. The number of individuals killed in rural areas was 10 in 1983, the same as the baseline period and 4 individuals died in urban pedalcycle collisions. Rural injuries from pedalcycle collisions were up 10.8% in 1983 over the four-year baseline period. This compares with a 18.5% urban gain over the same time period (Table 6-2).

Table 6-2 **RURAL — URBAN PEDALCYCLE ACCIDENTS**

Rural Areas	1979	1980	1981	1982	Previous 4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
Total Collisions	363	387	347	321	354	387	+ 9.3%
Persons Killed	12	9	14	4	10	10	NC
Persons Injured	364	395	353	335	362	401	+ 10.8%
Urban Areas							
Total Collisions	678	710	736	735	715	843	+ 17.9%
Persons Killed	2	2	6	4	3	4	+ 33.3%
Persons Injured	707	730	741	743	730	865	+ 18.5%

Sixty-eight point five percent of the Pedalcycle collisions occurred in the urban areas during 1983. This is down slightly from the 69.6% urban percentage in 1982, but follows closely the previous four year trend. 31.5% occured in the rural areas of the state, up slightly from 1982, but down from the previous 1979-81 period.

Figure 6-1 **Pedalcycle Collisions by Urban/Rural Locations**



PEDALCYCLIST KILLED AND INJURED — BY AGE

In 1983, 64.3% of the pedalcyclists killed were between the ages of 10 and 19, while 52.1% of those injured fell into this age bracket. The number of pedalcyclists killed in 1983 was up 7.7% compared to the 4 year average, and injuries rose 14.4% (Table 6-3).

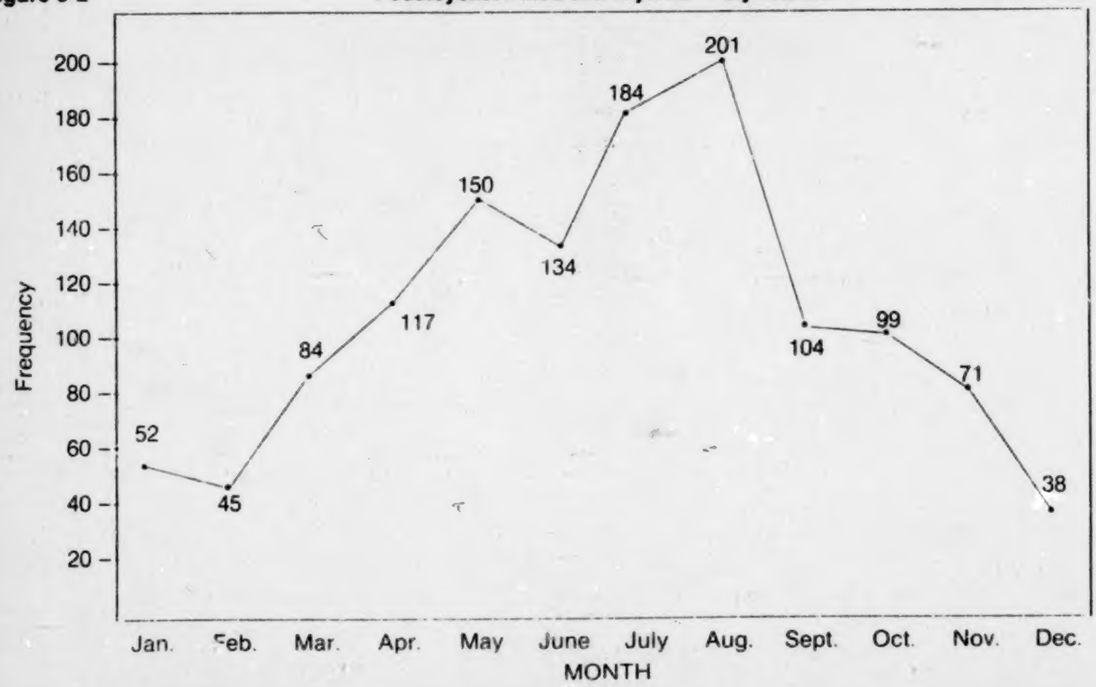
Table 6-3 AGE OF PEDALCYCLIST KILLED AND INJURED — 1979 - 1983

	Killed							Injured						
Age	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change
0 to 4	0	0	2	1	1	1	N/C	23	21	14	16	19	21	+ 10.5%
5 to 9	4	2	4	1	3	1	- 67.0%	201	217	180	160	190	180	+ 5.3%
10 to 14	5	5	2	1	3	5	+ 66.7%	338	365	306	331	335	404	+ 20.6%
15 to 19	2	2	5	1	3	4	- 33.3%	200	203	201	197	200	240	+ 20.0%
20 to 24	1	1	4	0	2	2	N/C	98	119	124	103	111	113	+ 0.2%
25 to 34	0	1	0	1	1	0	- 100.0%	76	97	118	126	104	139	+ 33.7%
35 to 44	0	0	1	0	0	0	N/C	20	26	43	31	30	47	+ 56.7%
45 to 54	1	0	0	1	1	0	- 100.0%	12	10	13	15	13	11	- 15.4%
55 to 64	1	0	1	1	1	0	- 100.0%	9	4	12	7	8	11	+ 37.5%
65 to 74	0	0	1	1	1	1	N/C	4	7	5	4	5	4	- 20.0%
75 and Older	0	0	0	0	0	0	—	1	3	3	2	2	4	+ 100.0%
Not Stated	0	0	0	0	0	0	—	89	53	60	56	65	63	- 3.1%
Total	14	11	20	8	13	14	+ 7.7%	1,071	1,125	1,079	1,048	1,081	1,237	+ 14.4%

PEDALCYCLE FATAL AND INJURY ACCIDENTS — BY MONTH

The warmer weather months of April through October contain a majority of the injury and fatal pedalcycle accidents. This seven-month period has had approximately 80% of the year's total injuries and fatalities for the period of 1979 through 1983. (Figure 6-2).

Figure 6-2 Pedalcyclist Killed and Injured — By Month



The cities of Bellingham, Olympia, and Wenatchee recorded the highest pedalcycle collision rates in the state during 1983 with a 71.9. 71.4, and 64.5 deaths per 100,000 population respectively. The city of Olympia had the highest pedalcyclist injury rate (78.6 per 100,000). They also recorded one pedalcycle fatality. Seattle had the greatest number of pedalcycle collisions and injuries but their collision and injury rate was slightly below the statewide average 44.6 injuries per 100,000 population (Figure 6-3).

Figure 6-3

Pedalcycle Collision Rate By Population
Cities 15,000 Population and Greater
1983

Population		Pedalcycle Deaths	Death *Rate	Pedalcycle Injuries	Injury *Rate	Total Pedalcycle Collisions	Collision *Rate
250,000 and Over							
Seattle	489,700	1	.20	213	43.5	212	43.3
100,000 to 250,000							
Spokane	170,200	0	-0-	88	51.7	84	49.4
Tacoma	158,400	0	-0-	85	53.7	81	51.1
50,000 to 100,000							
Bellevue	73,900	0	-0-	42	56.8	43	58.2
Everett	56,200	0	-0-	12	21.4	12	21.4
25,000 to 50,000							
Yakima	48,500	0	-0-	24	49.5	20	41.2
Bellingham	45,900	0	-0-	36	78.4	33	71.9
Vancouver	42,600	0	-0-	16	37.6	17	39.9
Kennewick	35,700	0	-0-	7	19.6	8	22.4
Bremerton	35,475	0	-0-	19	53.6	21	59.2
Renton	32,700	0	-0-	14	42.8	13	39.8
Richland	32,000	0	-0-	12	37.5	11	34.4
Longview	30,100	0	-0-	9	29.9	10	33.2
Auburn	29,000	0	-0-	12	41.4	11	37.9
Olympia	28,000	1	3.57	22	78.6	20	71.4
Edmonds	27,000	0	-0-	9	33.3	9	33.3
Redmond	26,300	0	-0-	8	30.4	7	26.6
Walla Walla	25,600	0	-0-	9	35.2	9	35.2
Kent	25,500	0	-0-	10	39.2	10	39.2
15,000 to 25,000							
Lynnwood	23,000	0	-0-	9	39.1	9	39.1
Pullman	23,000	0	-0-	12	52.2	11	47.8
Mercer Is.	21,150	0	-0-	11	52.0	11	52.0
Kirkland	18,850	1	5.31	7	37.1	7	37.1
Puyallup	18,500	0	-0-	11	59.5	10	54.1
Aberdeen	18,050	0	-0-	6	33.2	6	33.2
Wenatchee	17,150	0	-0-	12	70.0	11	64.5
Pt. Angeles	17,100	0	-0-	9	52.6	9	52.6
Mt. Lk. Terr.	16,000	0	-0-	3	18.8	3	18.8

*Frequency per 100,000

PEDESTRIANS

Overview

The number of pedestrians killed was down in 1983. The 89 killed was 21.9% fewer than the four-year average. This figure is a decrease of 12 from the 1982 total of pedestrian fatalities. The 1,701 pedestrians injured were 5.0% below the four-year average (Table 7-1).

Table 7-1

PEDESTRIANS KILLED AND INJURED 1979 — 1983
STATEWIDE — URBAN AND RURAL

	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
Pedestrians Killed	126	108	121	101	114	89	-21.9%
Pedestrians Injured	1851	1906	1696	1705	1790	1701	- 5.0%

LOCATIONS AND AGE GROUPS OF PEDESTRIAN ACCIDENTS

In 1983, rural areas experienced a decrease in pedestrian fatalities of 30.2% over the four-year average, and the number of pedestrians injured in rural accidents decreased 5.6% compared to the four-year average. The number of urban (i.e. population of 2500 or greater) pedestrian fatalities and injuries decreased by 11.8% & 4.7% respectively, compared to the four-year average (Table 7-2).

Table 7-2

	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
RURAL AREAS							
Pedestrian Killed	70	58	69	55	63	44	-30.2%
Pedestrian Injured	492	551	460	496	500	471	- 5.6%
URBAN AREAS (2,500 population and greater)							
Pedestrians Killed	56	50	52	46	51	45	-11.8%
Pedestrians Injured	1359	1355	1239	1209	1290	1230	- 4.7%

PEDESTRIANS KILLED AND INJURED — BY AGE

In 1983, 25.8% of the pedestrians kiled were between the ages of 5 and 19, while 37.7% of those injured fell into this age bracket. Twenty three point six (23.6) % of the pedestrians killed & 10.0% of the pedestrians injured were 65 years of age and older (Table 7-3).

Table 7-3

AGE OF PEDESTRIANS KILLED AND INJURED — 1979 - 1983

	Killed							Injured						
Age	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change
0 to 4	9	5	6	5	6	4	- 33.3%	69	86	71	79	76	84	+ 10.5%
5 to 9	6	5	9	6	7	6	- 14.3%	250	255	241	225	243	216	- 11.1%
10 to 14	2	3	6	6	4	4	N/C	203	208	201	209	205	216	+ 5.4%
15 to 19	9	7	13	8	9	13	+ 44.4%	195	206	169	219	197	209	+ 6.1%
20 to 24	16	10	11	9	12	6	- 50.0%	160	145	143	174	156	163	+ 4.5%
25 to 34	14	14	17	15	15	12	- 20.0%	223	231	220	235	227	222	- 2.2%
35 to 44	11	9	8	9	9	10	+ 11.1%	95	115	118	129	114	124	+ 8.8%
45 to 54	10	9	11	2	8	5	- 37.5%	92	109	78	69	87	97	+ 10.3%
55 to 64	10	6	8	11	9	8	- 11.1%	102	87	70	89	87	89	+ 2.3%
65 to 74	7	8	10	13	10	8	- 20.0%	82	93	89	61	81	90	+ 11.1%
75 and Older	23	21	16	17	19	13	- 31.6%	81	81	88	103	88	89	+ 1.1%
Not Stated	1	1	0	0	1	0	- 100.0%	156	115	97	113	120	102	- 15.0%
Total	118	98	115	101	108	89	- 17.6%	1,708	1,713	1,585	1,705	1,682	1,701	+ 1.1%

ACTIONS OF PEDESTRIANS KILLED AND INJURED
1983 — RURAL AND URBAN AREAS

In 1983, 35.2% of the pedestrians killed or injured in rural areas were struck while crossing not at an intersection. Another 21.9% were struck while crossing, entering roadway at an intersection. The most frequently involved age groups were the 5-14 year old and 15-24 year old age groups. They were involved in 30.3% and 28.4% of the total rural pedestrian collisions respectively (Table 7-4).

Table 7-4

RURAL AREAS	No. Killed	% of Total	Total Killed or Inj.	% of Total	Age 0-4	Age 5-14	Age 15-24	Age 25-64	Age 65 & Up	Not Stated
Crossing, entering roadway at intersection	8	18.2%	105	21.9%	2	34	25	27	11	6
Not at intersection	12	27.2%	169	35.2%	9	77	38	30	10	5
Walking with traffic	7	15.9%	37	7.7%	0	2	16	16	1	2
Walking against traffic	1	2.3%	11	2.3%	0	0	5	4	1	1
Standing or working in roadway	4	9.1%	38	7.9%	0	3	12	22	0	1
Playing in roadway	1	2.3%	17	3.5%	2	10	5	0	0	0
Lying in roadway	3	6.8%	7	1.5%	0	0	2	5	0	0
Not in roadway	8	18.2%	72	15.0%	1	14	28	25	3	1
Other & Not Stated	0	—	24	5.0%	0	6	6	7	3	2
TOTAL	44	100.0%	480	100.0%	14	146	137	136	29	18
Percent or Total Killed or Injured					2.9%	30.3%	28.4%	28.3%	6.0%	3.7%

For the urban areas, the greatest amount of pedestrian involvement in fatal and injury accidents occurred at intersections (51.2%) whereas 31.4% of the pedestrians killed and injured were struck while not at an intersection. The 5-14 year old age group was the most predominant age group involved in urban pedestrian accidents, with 23.7% of the total. (Table 7-5).

Table 7-5 ACTIONS OF PEDESTRIANS KILLED & INJURED — 1983

URBAN AREAS	No. Killed	% of Total	Total Killed or Inj.	% of Total	Age 0-4	Age 5-14	Age 15-24	Age 25-64	Age 65 & Up	Not Stated
Crossing, entering roadway at intersection	20	45.5%	625	51.2%	12	113	111	235	115	39
Not at intersection	13	29.5%	383	31.4%	47	137	53	94	32	20
Walking with traffic	0	—	24	2.0%	0	3	9	10	1	1
Walking against traffic	1	2.3%	11	0.9%	0	1	3	4	1	2
Standing or working in roadway	2	4.5%	48	3.9%	3	3	16	17	4	5
Playing in roadway	1	2.3%	29	2.4%	5	16	4	3	0	1
Lying in roadway	1	2.3%	3	0.2%	0	0	1	2	0	0
Not in roadway	2	4.5%	48	3.9%	2	6	16	19	4	1
Other & Not Stated	4	9.1%	50	4.1%	2	10	12	16	5	5
TOTAL	44	100.0%	1,221	100.0%	71	289	225	400	162	74
Percent of Total Killed or Injured					5.8%	23.7%	18.4%	32.7%	13.3%	6.1%

PEDESTRIAN ACCIDENTS
BY DAY OF WEEK AND HOUR OF DAY

Friday recorded 20.2% of the week's total number of fatal pedestrian accidents and 18.9% of total pedestrian accidents in 1983 (Figure 7-1). The 6:00 p.m. to 9:00 p.m. time period had the highest percentage of fatal pedestrian accidents (25.5%). The three-hour period from 3:00 p.m. to 6:00 p.m. had the largest percentage of total pedestrian collisions with 30.3% of the total (Figure 7-2).

Figure 7-1 **Total and Fatal Pedestrian Collisions by Day of Week — 1983**

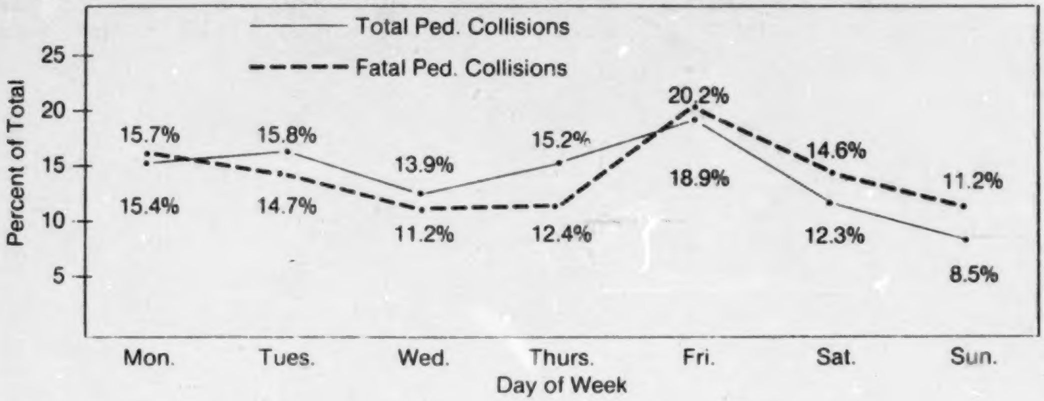
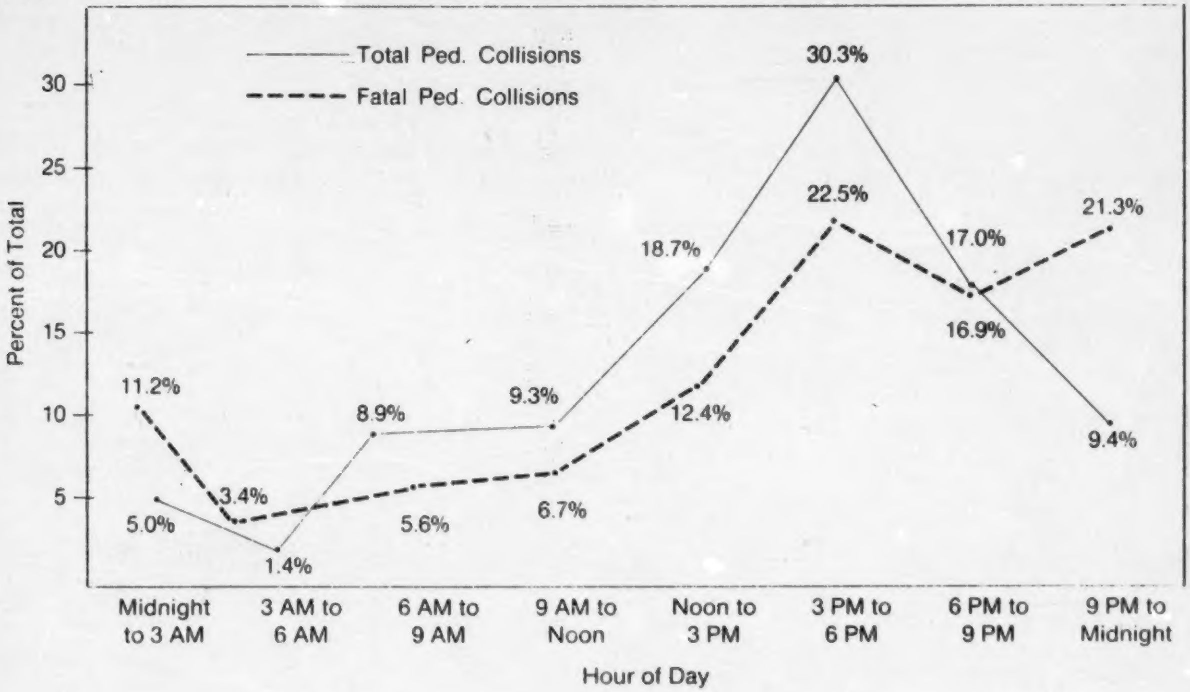


Figure 7-2 **Total and Fatal Pedestrian Collisions by Hour of Day — 1983**



The table below presents the 1983 number and rates for pedestrian traffic deaths, injuries, and total collisions for cities of 15,000 or more in Washington. Seattle had the greatest number of fatalities, but Bremerton had the greatest rate of pedestrian fatalities at 11.28 per 100,000 population. Seattle had the greatest number of pedestrian collisions and pedestrian injuries, as well as the highest rate for total pedestrian collisions (92.7 per 100,000) and pedestrian injuries (95.7 per 100,000). (Figure 7-5)

Figure 7-5

Pedestrian Collision Rate By Population
Cities 15,000 Population and Greater
1983

Population		Pedestrian Deaths	Death *Rate	Pedestrian Injuries	Injury *Rate	Total Pedestrian Collisions	Collision *Rate
250,000 and Over Population							
Seattle	489,700	19	3.27	469	95.6	454	92.7
100,000 to 250,000 Population							
Spokane	170,200	2	1.18	119	69.9	107	62.9
Tacoma	158,400	3	1.89	128	80.8	125	78.9
50,000 to 100,000 Population							
Bellevue	73,900	0	-0-	35	47.4	32	43.3
Everett	56,200	1	1.78	27	48.0	25	44.5
25,000 to 50,000 Population							
Yakima	48,500	1	2.06	37	76.3	35	72.2
Bellingham	45,900	0	-0-	16	34.9	16	34.9
Vancouver	42,600	1	2.35	22	51.6	20	46.9
Kennewick	35,700	0	-0-	12	33.6	12	33.6
Bremerton	35,475	4	11.28	27	75.1	31	87.4
Renton	32,700	2	6.12	16	48.9	16	48.9
Richland	32,000	2	6.25	8	25.0	10	31.3
Longview	30,100	1	3.32	23	76.4	21	69.8
Auburn	29,000	0	-0-	8	27.6	8	27.6
Olympia	28,000	1	3.57	23	82.1	21	75.0
Edmonds	27,000	0	-0-	8	29.6	7	25.9
Redmond	26,300	0	-0-	5	19.0	4	15.2
Walla Walla	25,600	2	7.81	14	54.7	14	54.7
Kent	25,500	0	-0-	10	39.2	10	39.2
15,000 to 25,000 Population							
Lynnwood	23,000	0	-0-	13	56.5	11	47.8
Pullman	23,000	0	-0-	8	34.8	7	30.4
Mercer Is.	21,150	1	4.73	10	47.3	10	47.3
Kirkland	18,850	1	5.31	8	42.4	9	47.7
Puyallup	18,500	1	5.41	10	54.1	10	54.1
Aberdeen	18,050	0	-0-	11	60.9	9	49.9
Wenatchee	17,150	1	5.83	15	87.5	15	87.5
Pt. Angeles	17,100	0	-0-	13	76.0	12	70.2
Mt. Lk. Terr.	16,000	0	-0-	6	37.5	5	31.3

*Frequency per 100,000 population

HEAVY TRUCKS

Overview

In 1983, 6,525 heavy trucks were involved in collisions, for a 3.9% decrease over the four year baseline. Registrations in 1983 totaled 145,595, a 5.7% increase over the four year average. Based on this registration figure, the 1983 collision rate was 448.2 collisions per 10,000 registered trucks, a decrease of 9.0% over the previous four year average.

There were 65 heavy trucks involved in fatal collisions during 1983. This represents a 32.3% decrease over the baseline average. The fatal collision rate of 4.5 collisions per 10,000 registered trucks is a 35.7% decrease over the baseline period (Table 8-1).

Table 8-1 SUMMARY OF HEAVY TRUCKS
10,000 GROSS VEHICLE WEIGHT (GVW) AND GREATER INVOLVED IN TRAFFIC COLLISIONS

	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
Total Trucks Involved in Collisions*	8,047	7,164	6,122	5,822	6,789	6,525	- 3.9%
Trucks Involved in Fatal Collisions	116	108	97	63	96	65	-32.3%
Registration of Heavy Trucks**	132,220	136,669	141,042	141,225	137,789	145,595	+ 5.7%

COLLISIONS PER 10,000 REGISTERED TRUCKS

RATES:	1979	1980	1981	1982	4 Yr. Avg.	1983	% of Change 1983 to 4 Yr. Avg.
Total Collisions Rate	608.6	524.2	434.1	412.2	492.7	448.2	- 9.0%
Fatal Collision Rate	8.8	7.9	6.9	4.5	7.0	4.5	-35.7%

*Minimum damage for a reportable collision $300 to the property of any one person
**Estimated

LOCATION OF HEAVY TRUCK COLLISIONS BY SEVERITY

In 1983, 52.5% of the heavy trucks involved in total collisions were in urban areas (Figure 8-1). In 1983 there were 17 heavy trucks involved in fatal accidents in urban areas, compared to 48 in the rural areas. These figures comprise a 26 - 74% urban/rural proportion of involvement in fatal accidents, (Figure 8-2). The 1983 heavy truck involvement in injury accidents was split; 921 urban to 1106 rural. These figures are a 45 - 55% urban/rural split, which varies only slightly from the previous four year average (Figure 8-3).

Figure 8-1 Heavy Truck Collision Involvement by Urban/Rural Location

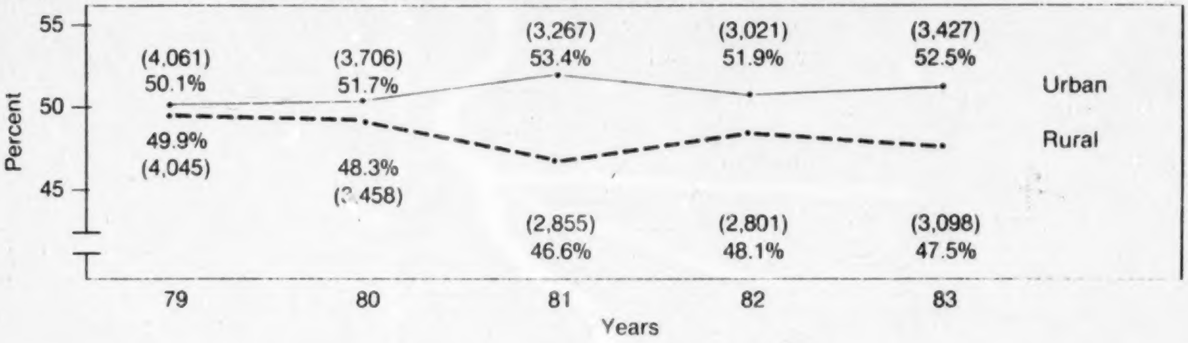


Figure 8-2 Heavy Trucks Involved in Fatal Collisions by Urban/Rural Location

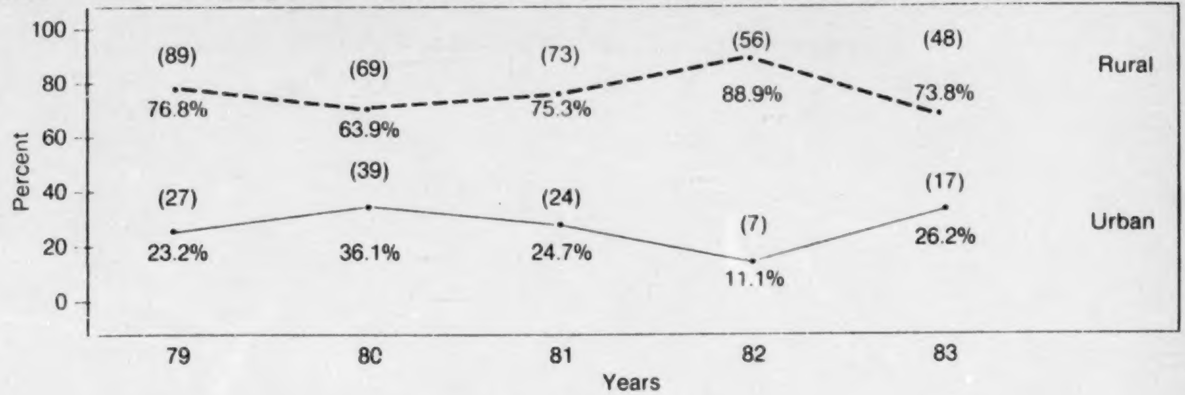
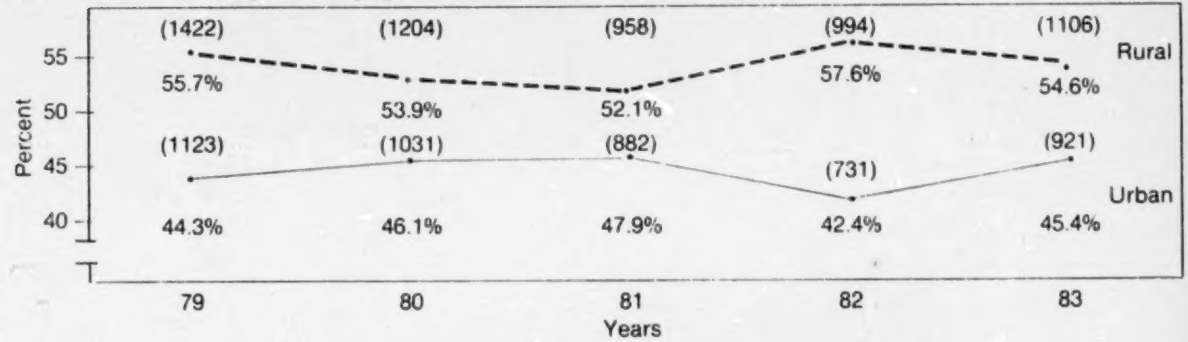


Figure 8-3 Heavy Truck Injury Involvement by Urban/Rural Location



AGE OF DRIVERS INVOLVED IN HEAVY TRUCK COLLISIONS IN 1983

In 1983, the 19-year old and under and 20-29 year old age group were the only two age groups to be over-represented in collisions compared to the percentage of licensed drivers each group comprised. The 19 and under group made up only .3% of all licensed heavy truck operators, yet this group was involved in 3.4% of all heavy truck accidents, 1.6% of the fatal accidents and 3.4% of the injury accidents for heavy trucks. The ratio for percent of accident involvement compared to percent of licensed drivers comprised by this age group resulted in an over-representation ratio of 11.3 for the 19 and under age group. The 20-29 year old age group was involved in 31.9% of the total collisions, 41.0% of the fatal collisions and 31.6% of the injury collisions. This group comprises 19.5% of all drivers having a classified endorsement on their licenses. Based on the percent of licensed drivers and accident involvement, this group was over-represented in accidents by a ratio of 1.6. The remainder of the driver age groups are under-represented in total, fatal and injury accident categories (Table 8-2).

Table 8-2

Age	All Accidents Frequency	%	Fatal Accidents Frequency	%	Injury Accidents Frequency	%	*Percent of Classified End. Drivers	**Over/Under representation
19 & Under	188	3.4	1	1.6	62	3.4	0.3%	11.33:1
20-29	1,757	31.9	25	41.0	570	31.6	19.5%	1.64:1
30-39	1,614	29.3	13	21.3	506	28.1	33.1%	.88:1
40-49	1,022	18.5	10	16.4	359	19.9	21.9%	.84:1
50-59	697	12.6	7	11.5	236	13.1	14.7%	.86:1
60 & Over	236	4.3	5	8.2	71	3.9	10.5%	.41:1

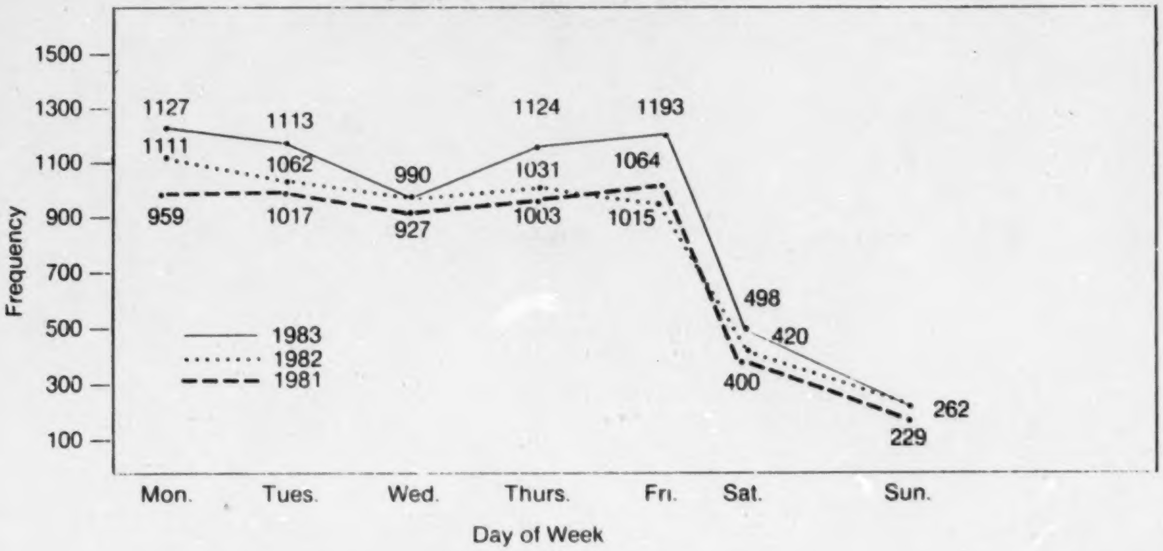
*Classified Endorsement is only required for operators of the larger trucks and truck combinations
**Percent of collision involvement to percent of licensed drivers

HEAVY TRUCK ACCIDENT OCCURRENCE BY TIME

The daily frequency of heavy truck accidents in 1983 was slightly more than the previous two years, though following the same frequency pattern. The weekdays had the largest frequency of heavy truck involvement in collisions. During the weekends there is a substantial decline in the frequency of heavy truck involvement in collisions (Figure 8-4).

Figure 8-4

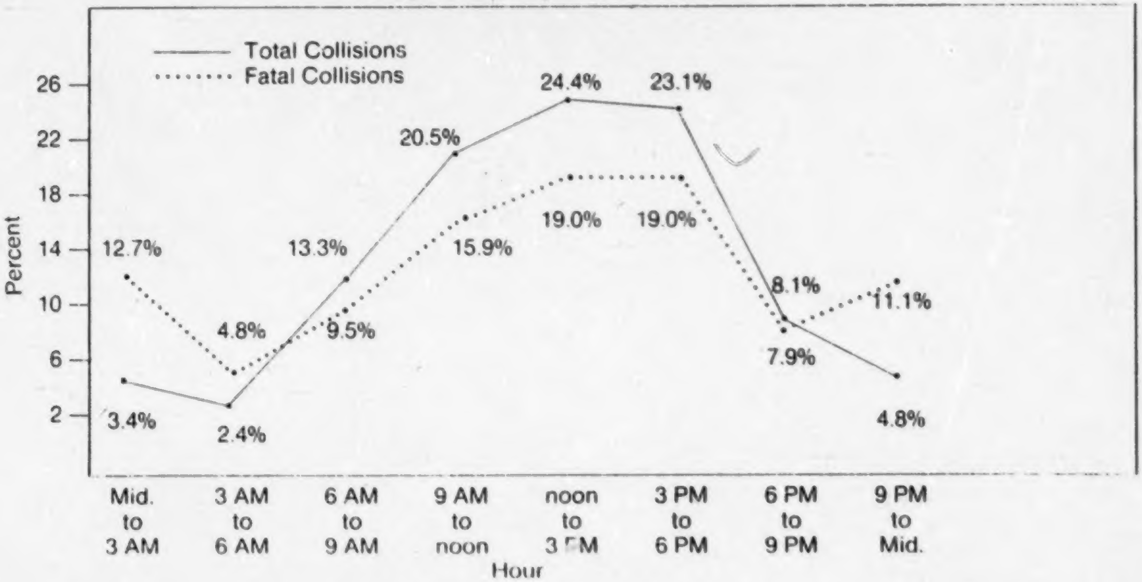
Heavy Truck Involvement in Total Collisions by Day of Week for 1981 - 1983



In 1983, the time period from noon to 3 PM recorded the highest incidence of heavy truck involvement in collisions. There was a substantial build up of collisions starting with the 3 AM to 6 AM time period, peaking at the noon to 3 PM period. The two 3 hour periods from noon to 3 PM & 3 PM to 6 PM each recorded 19.0% of the fatal collisions (Figure 8-5).

Figure 8-5

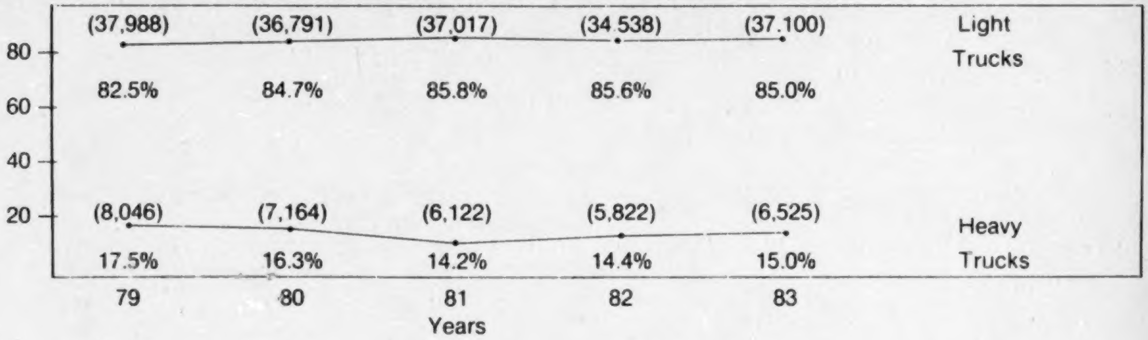
Heavy Truck Involvement in Total and Fatal Collisions by Hour of Day — 1982



TOTAL COLLISIONS — LIGHT TRUCKS vs. HEAVY TRUCKS

In 1983, there were 37,100 light trucks and 6,525 heavy trucks involved in collisions. This is a 85.0% - 15.0% ratio between light and heavy trucks which flatens a four-year trend for light trucks increasing involvement and heavy trucks decreasing involvement in total truck collisions (Figure 8-6).

Figure 8-6 **Light & Heavy Truck Involvement in Total Collisions 1979 - 1983**



COLLISIONS BY FIRST HARMFUL EVENT

During 1983, heavy trucks were involved in 4,577 collisions involving another moving vehicle. This represents 72.6% of all heavy truck collisions. They were involved in 409 collisions or 6.5% in which the other vehicle was parked. Heavy trucks were involved in 689 collisions with fixed or other objects, which represents 10.9% of the total. Overturning, other non-collisions, and all other collisions accounted for the remaining 10.0% of the collisions (Table 8-3).

Table 8-3 **HEAVY TRUCK COLLISIONS BY FIRST HARMFUL EVENT — 1980, 1981, 1982 & 1983**

	1980		1981		1982		1983	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Collision with other moving motor vehicle	4,901	71.3	4,224	71.7	3,984	71.2	4,577	72.6
Collision with parked motor vehicle	541	7.9	468	7.9	422	7.5	409	6.5
Collision with fixed or other object	745	10.8	648	11.0	646	11.5	689	10.9
Overturning	406	5.9	317	5.4	331	5.9	394	6.2
Other non-collision	157	2.3	134	2.3	135	2.4	145	2.3
All other collisions/Pedestrian, Pedalcyclist, etc.	122	1.8	100	1.7	81	1.5	93	1.5

HEAVY TRUCK DEFECTS

In 1983, 12.6% of the heavy trucks involved in all collisions had one or more defects. This compares to 11.3% in 1982 and 10.8% in 1981. Defective brakes constituted 40.0% of the defects detected. Other defects and their percentages were smooth tired 16.5%; puncture or blowout 6.7%; defective rear lights 7.7%; defective steering 4.0% and all other defects 34.2%. (Table 8-4).

Table 8-4 **DEFECTS OF HEAVY TRUCKS INVOLVED IN COLLISIONS — 1980, 1981, 1982 & 1983**

	1980		1981		1982		1983	
Condition of Vehicle	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Defective Brakes	199	34.3	202	40.3	185	36.4	228	40.0
Defective Headlights	4	0.7	4	0.8	2	0.4	5	0.9
Defective Rear Lights	50	8.6	37	7.4	46	9.1	44	7.7
Defective Steering Mechanism	15	2.6	22	4.4	20	3.9	23	4.0
Puncture or Blowout	44	7.6	28	5.6	31	6.1	38	6.7
Worn or Smooth Tires	95	16.4	84	16.8	70	13.8	94	16.5
Other Defects	173	29.8	124	24.8	154	30.3	195	34.2

[1] Based on 4,996 trucks involved in total investigated collisions.

PUPIL TRANSPORTATION

Overview

In the 1982-1983 school year there were 256 reported school bus collisions in which 2 persons were killed and 166 were injured. This was a 9.9% decrease over the three year baseline in total school bus collisions; a 1.8% decrease in the number of persons injured.

There were 6,286 registered school buses in the 1982-1983 school year. This was a 5.1% increase in registrations over the three year baseline period. (Table 9-1).

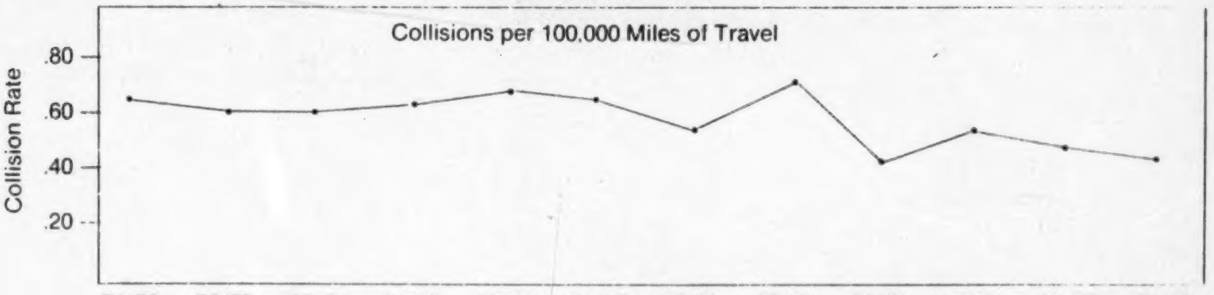
Table 9-1 FOUR YEAR COMPARISON OF COLLISIONS INVOLVING SCHOOL BUSES
1979/1980 — 1982/1983

	School Year					Percent of Change '82-83 to 3 Yr. Avg.
	1979 1980	1980 1981	1981 1982	Prev. 3 Yr. Average	1982 1983	
Total Collisions	246	324	281	284	256	- 9.9%
Fatal Collisions	1	1	2	1	2	+
Number Killed	1	1	2	1	2	+
Injury Collisions	73	112	90	92	85	- 3.3%
Injuries	151	201	155	169	166	- 1.8%
Property Damage Only Collisions	172	211	189	191	169	-11.5%
School Bus Registration	5,761	6,052	6,127	5,980	6,286	+ 5.1%
*Registration Collision Rate	42.7	53.5	45.9	47.5	40.7	-14.3%
Miles Traveled (In Thousands)	59,268.1	57,471.8	58,619.5	58,453.1	64,713.1	+10.7%
**Mileage Collision Rate	.42	.56	.48	.49	.40	-18.4%

*Collisions per 1,000 registered vehicles
**Collisions per 100,000 miles of travel

In 1982-1983 school year, the school bus mileage collision rate was .40 collisions per 100,000 miles of travel (Figure 9-1). This rate was down from the 1981-82 rate of .48 and down over the rate of .49 for the previous three years (See Table 9-1)

Figure 9-1 COMPARISON OF SCHOOL BUS MILEAGE COLLISION RATE
71/72 to 82/83 School Year

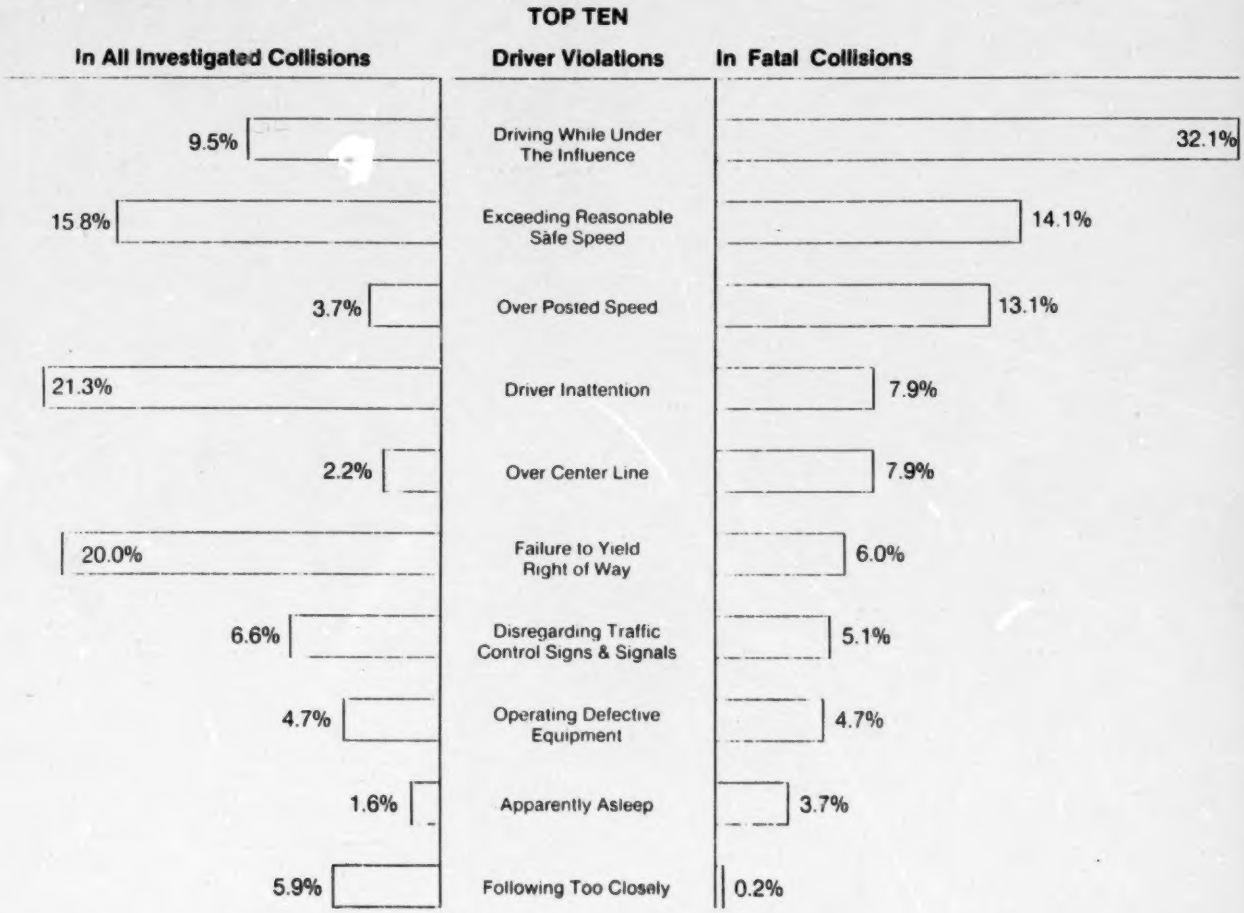


CONTRIBUTORY DRIVER VIOLATIONS

Overview

Driving while under the influence of intoxicating liquor contributed to 32.1% of the driver violations in fatal collisions & 9.5% of all investigated collisions. Driver inattention contributed to 21.3% of all investigated collisions & 7.9% of the violations in fatal collisions (Figure 10-1).

Figure 10-1



VEHICLE DEFECTS

Overview

In investigated collisions during 1983 only 5.2% of the accident-involved vehicles were found to have contributory vehicle defects. The most common defect was worn, smooth tires. This defect was common to 2,964 vehicles and represented a 2.0% decrease compared to the previous four-year average. Defective brakes were the second most contributory circumstance. This defect was found on 1,514 collision involved vehicles last year, a drop of 0.9% compared to the baseline (Table 10-1).

Table 10-1

VEHICLE CONDITION
(In Investigated Collisions Only)

	1979	1980	1981	1982	4 Yr. Avg.	1983	Percent of Change 1983 to 4 Yr. Avg.
Defective Tires:							
Worn or Smooth Tires	3,040	3,302	3,054	2,828	3,056	2,964	- 2.0%
Puncture or Blowout	719	683	557	446	601	462	- 23.1%
Defective Brakes	1,600	1,543	1,585	1,383	1,528	1,514	- 0.9%
Defective Lights:							
Headlights	214	220	184	150	192	149	- 22.4%
Rear Lights	477	482	403	394	439	361	- 17.8%
Other Lights/Reflectors	3	122	117	95	84	95	+ 13.1%
Defective Steering	249	360	334	281	306	308	+ 0.7%
All Other Defects	644	1,316	1,080	1,145	1,046	1,387	+ 32.6%
No Defects	145,861	135,008	136,592	123,345	135,202	131,273	- 2.9%
Total Vehicles Involved	152,807	143,036	144,082	130,067	142,498	138,513	- 2.8%

S8428-1(u)
Errata

Drivers Involved in Fatal Collisions

In 1983, 39.4% of the drivers involved in statewide fatal collisions had been drinking intoxicants. This was a 16.5% decrease over the four year baseline period. In the rural areas 41.0% of the drivers involved in fatal accidents had been drinking alcohol, a decrease of 14.2% over the baseline. Urban areas recorded a 35.5% alcohol involvement rate in 1983. This was a 22.0% decrease in the percentage of alcohol involvement compared to the 4 year average (Table 2-1).

Table 2-1

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS

		Drivers Involved in Fatal Collisions						
	Condition of Driver (Sobriety)	**1979**	**1980**	**1981**	**1982**	**Prev. 4 Yr. Average**	**1983**	**Change 83 - 4 Yr. Avg.**
STATEWIDE	Had been drinking - ability impaired	426	437	364	333	390	260	- 33.3%
	Had been drinking - ability not impaired	77	62	74	39	63	37	- 41.3%
	Had been drinking - sobriety unknown	56	69	68	51	61	31	- 49.2%
	Had not been drinking	669	584	556	489	575	502	- 12.7%
	Not stated	101	94	71	49	79	62	- 21.5%
	Total drivers	1,329	1,246	1,133	961	1,167	892	- 23.6%
	Total driver drinking	559	569	506	423	514	328	- 36.2%
	Total drivers - excluding not stated	1,228	1,152	1,062	912	1,089	832	- 23.6%
	No. drinking drivers per 100 involved	45.5	49.4	47.6	46.4	47.2	39.4	- 16.5%
	No. of drunk drivers per 100 involved	34.7	37.9	34.3	36.5	35.8	31.3	- 12.6%
RURAL	Had been drinking - ability impaired	318	328	291	265	301	198	- 34.2%
	Had been drinking - ability not impaired	51	47	57	28	46	28	- 39.1%
	Had been drinking - sobriety unknown	38	48	46	36	42	24	- 42.9%
	Had not been drinking	506	419	406	362	423	360	- 14.9%
	Not stated	45	44	33	21	36	32	- 11.1%
	Total drivers	958	886	833	712	847	642	- 24.2%
	Total driver drinking	407	423	394	329	388	250	- 35.6%
	Total drivers - excluding not stated	913	842	800	691	812	610	- 24.9%
	No. drinking driver per 100 involved	44.6	50.2	49.3	47.6	47.8	41.0	- 14.2%
	No. of drunk drivers per 100 involved	34.8	39.0	36.4	38.4	37.1	32.5	- 12.4%
URBAN	Had been drinking - ability impaired	108	109	73	68	90	62	- 31.1%
	Had been drinking - ability not impaired	26	15	17	11	17	9	- 47.1%
	Had been drinking - sobriety unknown	18	21	22	15	19	7	- 63.2%
	Had not been drinking	163	165	150	127	151	142	- 6.0%
	Not stated	56	50	38	28	43	30	- 30.2%
	Total drivers	371	360	300	249	320	250	- 21.9%
	Total driver drinking	152	145	112	94	126	78	- 38.1%
	Total drivers - excluding not stated	315	310	262	221	277	220	- 20.6%
	No. drinking drivers per 100 involved	48.3	46.8	42.7	42.5	45.5	35.5	- 22.0%
	No. of drunk drivers per 100 involved	34.3	35.2	27.9	30.8	32.5	28.2	- 13.2%

*Amended 10-17-84.

Alcohol Involvement by Age Group

The younger driver, under 30 years of age, is over-represented in alcohol-related accidents. In 1983, the 16-20 year old drivers were involved in 18.5% of all alcohol-related accidents while comprising only 8.3% of all licensed drivers. The over-representation ratio for this age group is 2.2, indicating that the 16-20 year old drivers were involved in 2.2 times more alcohol-related collisions than the percentage of licensed drivers they represent. The 2.2 over-representation ratio was the same as the previous year (Figure 2-6). The 21-24 year old group is also involved in twice as many alcohol-related collisions as the portion of total drivers this age group represents. The over-involvement ratio of 2.4 is above the previous year (Figure 2-7). In 1983, the 25-29 year old group was involved in 1.45 times more alcohol-related crashes than the percentage of licensed drivers they represented. This group's over-involvement ratio increased from the previous year (Figure 2-8). The remaining age group, 30 years and older, was .60 times under-represented in alcohol-related crashes (Figure 2-9).

Figure 2-6 **16 - 20 Year Old Involvement In Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group**

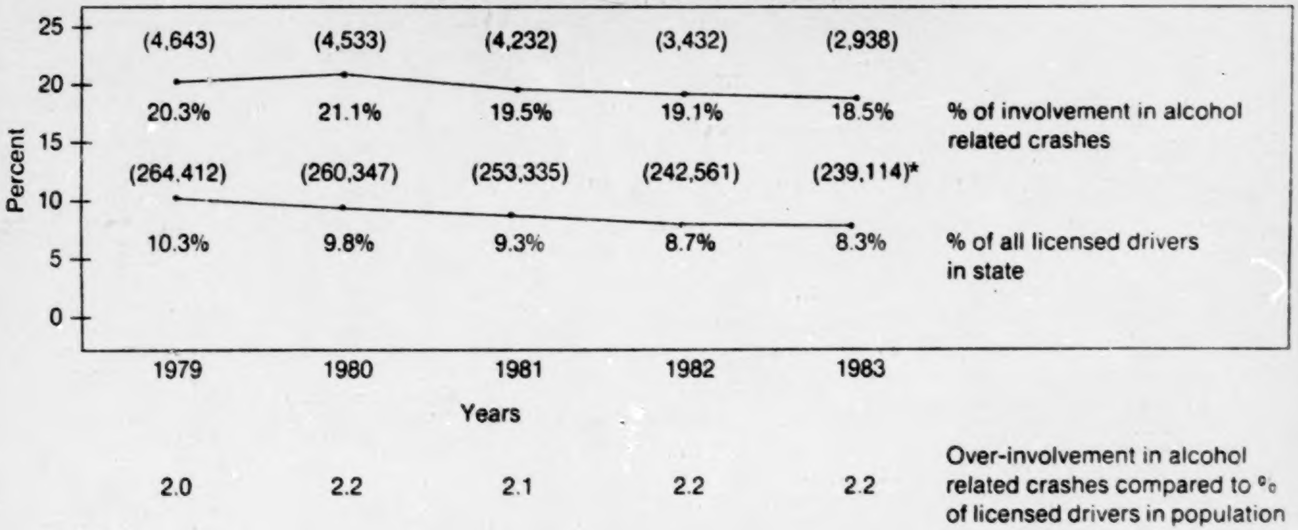
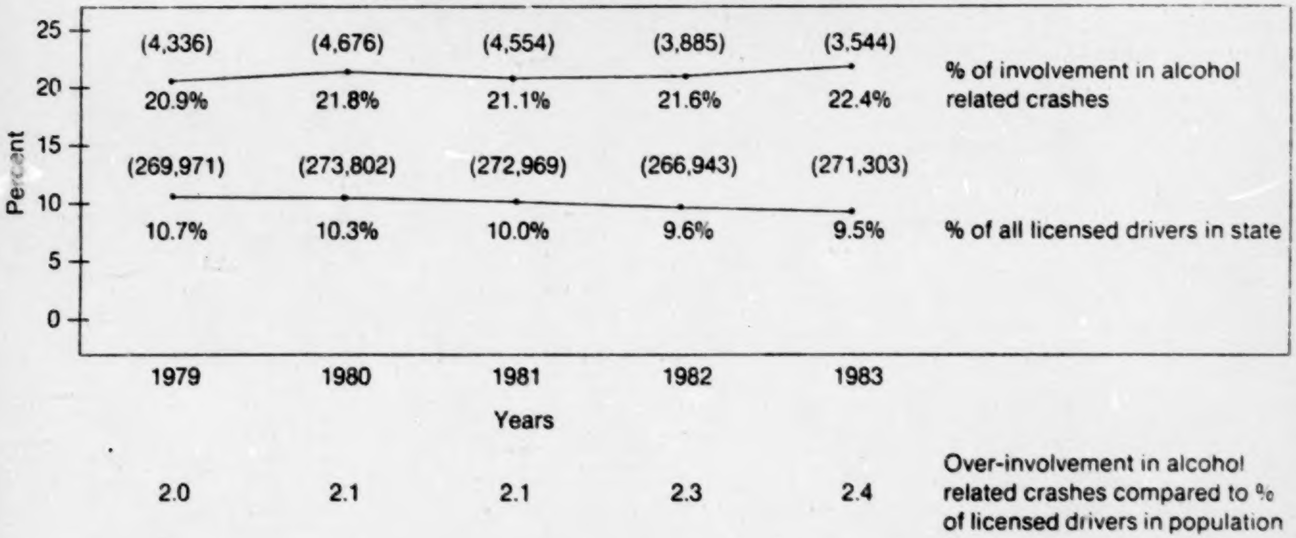


Figure 2-7 **21 - 24 Year Old Involvement In Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group**



Errata

YOUTH INVOLVEMENT

Overview

In 1983, the young drivers (20 years old and younger) comprised 8.3% of all licensed drivers. This group was involved in 19.5% of the total 1983 collisions, for an accident over-representation rate 2.3 times higher than the percentage of licensed drivers comprising this group. The 21-24 year old age group was involved in 14.4% of the total collisions, while comprising 9.5% of all licensed drivers. The over-representation factor for this group was 1.5. The 25-29 year old age group was the modal group. It represented 14.8% of all accidents and 13.2% of all licensed drivers. It was over-represented by a factor of 1.23. All other age groups with the exception of the 65-69 age group, were under-represented when comparing the percentage of involvement in accidents to the percentage of licensed drivers comprising the groups (Table 3-1).

DRIVER AGE DISTRIBUTION — 1983

Table 3-1 **COMPARISON OF DRIVERS INVOLVED TO NUMBER LICENSED**

Age of Driver	Involved in Collisions Number	% of Total	Percent of Licensed Driver	Over/Under Representation Ratio
Under 16	700	0.43	—	—
16	4,513	2.79	0.93%	3.00
17-18	13,091	8.09	3.24%	2.50
19-20	13,252	8.18	4.17%	1.96
21-22	12,318	7.61	4.60%	1.65
23-24	11,036	6.82	4.86%	1.23
25-29	24,002	14.82	13.15%	1.23
30-34	19,604	12.11	12.92%	.68
35-39	15,202	9.39	11.40%	.86
40-44	10,698	6.61	8.65%	.71
45-49	7,687	4.75	6.77%	.74
50-54	6,936	4.28	6.13%	.60
55-59	6,485	4.00	6.11%	.64
60-64	5,702	3.52	5.84%	.35
65-69	4,228	2.61	4.73%	1.09
70 and over	6,482	4.00	6.50%	.98

YOUTHFUL DRIVER INVOLVEMENT IN COLLISIONS BY FIRST HARMFUL EVENT

In 1983, 72.3% of youthful driver's (24 years old and younger) involvement in total collisions involved colliding with other moving vehicles. This type of collision also resulted in the greatest percentage of fatal collisions (37.9%) and injury collisions (67.4%). Single vehicle collisions with fixed objects led to the second largest percentage of youthful driver involvement in total, fatal and injury collisions, at 17.0, 34.5 and 19.3% respectively (Table 3-2).

Table 3-2 **YOUTHFUL DRIVERS BY FIRST EVENT — 1983**

	In Total Collisions	Percent of Total	In Fatal Collisions	Percent of Total	In Injury Collisions	Percent of Total
Collision with other moving motor vehicles	34,476	72.3%	100	37.9%	12,909	67.4%
Collision with parked vehicle	1,971	4.1%	5	1.9%	513	2.7%
Collision with fixed/ other object	8,101	17.0%	91	34.5%	3,702	19.3%
Overturning and other non-collision	2,170	4.5%	37	14.0%	1,322	6.9%
Other Collision with Ped/Pedal, Animal, R.R. Train	988	2.1%	31	11.7%	714	3.7%
TOTAL	47,706	100.0%	264	100.0%	19,160	100.0%

*Amended 10-17-84.

YOUTHFUL COLLISION INVOLVEMENT BY AGE GROUP

In 1983, the 16-20 year old age group's frequency and percent of involvement in total collisions continued to diminish along with the percent of total licensed drivers this age group comprises. This group's over-representation ratio (% of total collisions ÷ % of licensed drivers) of **2.30 was up from the 2.25 ratio for the past year.** It is also the highest over-representation ratio for any age group (Figure 3-1). The 21-24 year old age group maintained an over-representation ratio of 1.5 for the fifth year in a row (Figure 3-2). The 25-29 year old age group had the smallest over-representation ratio of the youthful drivers in 1983 at 1.12 down slightly from the 1.15 ratio in 1982 (Figure 3-3). The 30 year old and over age group continues to be under-represented in total collisions compared to the percentage of licensed drivers this age group comprises (Figure 3-4).

Figure 3-1

16-20 Year Old % Of Involvement In Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

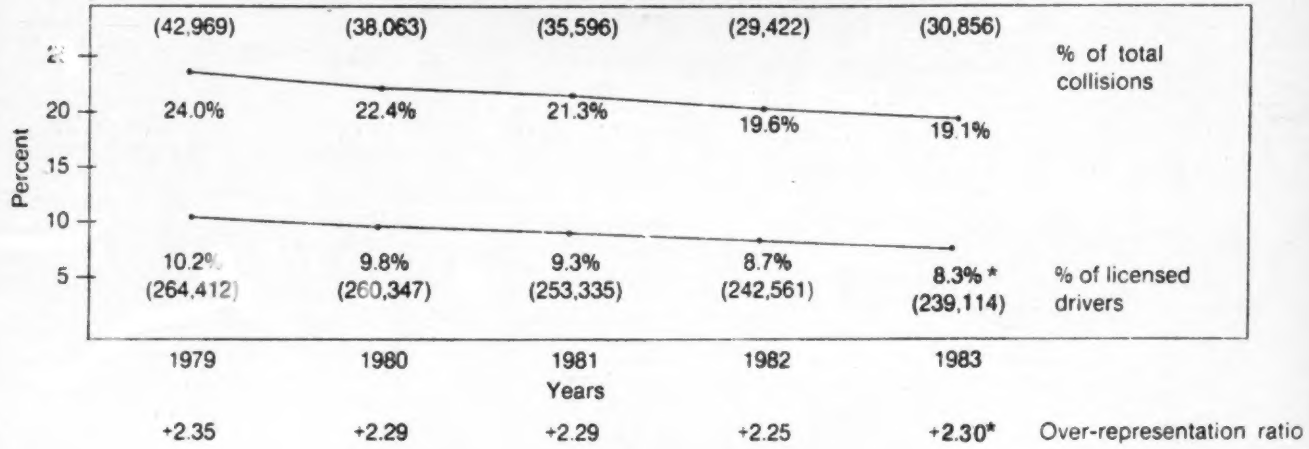


Figure 3-2

21-24 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

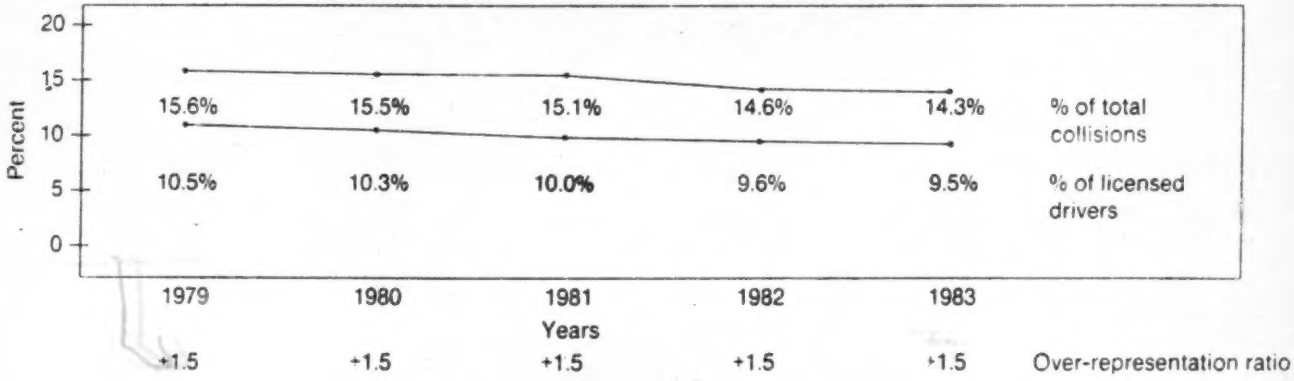
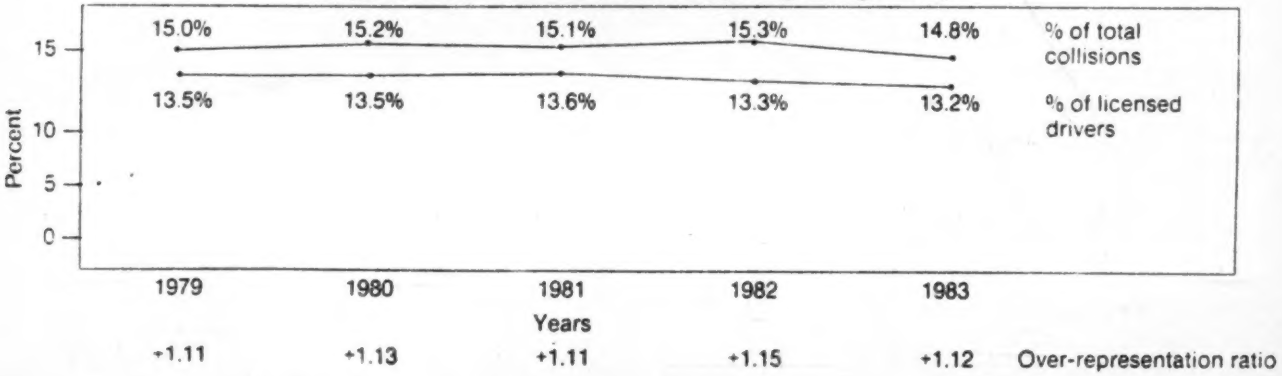


Figure 3-3

25-29 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group



S8428-1

STATE OF WASHINGTON

DATA SUMMARY & ANALYSIS
of
1984 TRAFFIC COLLISIONS

Prepared By:

Orman Vertrees, Research Investigator
Washington Traffic Safety Commission

PART II

OVERALL STATEWIDE PROBLEM ANALYSIS

II — OVERALL STATEWIDE PROBLEM ANALYSIS

List of Statistical Tables and Charts

Page

Statewide Summary

Impact and Exposure Rates II-1
Fatalities by Status II-2
Traffic Deaths, Travel, Death Rate, Reported Collisions & Injuries II-3
Multiple, Single, Vehicle-Pedestrian, and Vehicle Pedalcycle Collisions II-4
Traffic Deaths and Death Rates by County II-5
Highways Travel and Traffic Fatalities—1984 ..... II-6
Traffic Fatalities in 1984 and Percent Change from 1983 ..... II-7
Traffic Fatalities by Age and Sex 1984 ..... II-7
Persons Killed & Injured by Age by Status II-8
Comparison of Traffic Deaths by Month II-8
Collision Rates by County Population II-9
Collision Rates by City Population II-10

Explanation of Problem Analysis Process II-11

Impact Problems

Alcohol Involvement II-14
Youth Involvement II-27
Safety Restraint Usage II-32
Motorcycle Collisions II-40
Pedalcycle II-47
Pedestrians II-50
Heavy Trucks II-54
Pupil Transportation II-58
Contributing Driver Violations II-59
Vehicle Defects II-60

STATEWIDE SUMMARY

Overview

The number of persons killed on the state's highways in 1984 totalled 761, a 2.2% decline from the 1981-1983 three-year baseline average of 778. Similarly, there was a 2% drop in the total number of fatal collisions for 1984 compared to the average for 1981-1983. Increases for 1984 over the three-year baseline period were recorded in the categories of total collisions, injury collisions, total number of persons injured and property damage only collisions (Table 1-1).

Table 1-1

	Years				Prev. 3 Yr. Average (81-83)	% of Change '84 - 3 Yr. Average
IMPACT	1984	1983	1982	1981		
Total Collisions	111,655	106,597	100,644	111,993	106,411	+ 4.9%
Fatal Collisions	687	635	679	790	701	- 2.0%
Total Killed	761	705	757	872	778	- 2.2%
Injury Collisions	42,076	40,273	37,790	41,947	40,003	+ 5.2%
Total Injured	61,366	58,317	54,789	61,083	58,063	+ 5.7%
Property Damage Only Collisions	68,892	65,689	62,175	69,256	65,707	+ 4.8%

Exposure

A 7.6% increase in motor vehicle miles travelled was recorded for 1984 over the 1981-1983 baseline period. Motor vehicle registration jumped by 2.8% over baseline while the number of licensed drivers was up 6.5%. In 1984 the state's population increased over the 1981-83 average by 1.5% to a total of 4,328,100 persons (Table 1-2).

Table 1-2

	Years				Prev. 3 Yr. Average (1981-1983)	% of Change 1984 to prior 3 yr. Average
EXPOSURE	1984	1983	1982	1981		
**Motor Vehicle Travel	33,344.0	32,275.0	30,353.0	30,346.0	30,991.0	+ 7.6%
Motor Vehicle Registration	3,459,772	3,372,966	3,313,348	3,408,871	3,365,062	+ 2.8%
Licensed Drivers	2,973,468	2,867,032	2,774,212	2,732,722	2,791,322	+ 6.5%
State's Population	4,328,100	4,285,100	4,264,000	4,248,100	4,265,733	+ 1.5%

**In Millions

Rates

The 1984 motor vehicle traffic death rate rose slightly to 2.28 deaths per 100 million vehicle miles of travel from 1983's 2.18. However, this represented a 9.2% decline from the baseline average. The rate of 1.84 injuries per one million vehicle miles in 1984 was a 1.6% decline from the baseline (Table 1-3).

Table 1-3

	Years				Prev. 3 Yr. Average (1981-1983)	% of Change 1984 to prior 3 yr. Average
RATES	1984	1983	1982	1981		
Death Rate (Deaths per 100M vehicle miles)	2.28	2.18	2.49	2.87	2.51	- 9.2%
Injury Rate (Injury per 1M vehicle miles)	1.84	1.81	1.81	2.01	1.87	- 1.6%

Fatalities by Status

Drivers continued in 1984 as the most common status of those killed as a result of motor vehicle collisions. Fatalities in this classification increased from 343 in 1983 to 392 in 1984. The 1984 figure increased 5.7% from the average of the three previous years. In contrast, the number of motorcycle drivers fatally injured in collisions declined from 72 in 1983 to 62 the following year. This represented a 26.2% decline over the three-year baseline (Table 1-4).

Table 1-4

Status	Years				Prev. 3 Yr. Average (1981-1983)	% of Change '84 - 3 Yr. Average
	1984	1983	1982	1981		
Drivers (does not include motorcyclists)	392	343	354	416	371	+ 5.7%
Passengers	189	182	186	214	194	- 2.6%
Pedestrians	97	89	101	121	104	- 6.7%
Bicyclists	11	14	8	20	14	- 21.4%
Motorcycle Drivers	62	72	92	88	84	- 26.2%
Motorcycle Passengers	10	5	16	13	11	- 9.0%
Totals	761	705	757	872	778	- 2.2%

Traffic Collisions, Deaths, Injuries, Travel and Death Rate

The steady decline in the number of traffic fatalities that followed the state's 1979 high point of 1,034 reached bottom at 705 in 1983 but then ascended to 761 the following year for a 7.9% increase. The 1984 count, however, was still the third lowest since the same number was recorded in 1974 (Figure 1-1). Motor vehicle travel in 1984 increased by 3.3% over 1983 to reach an all-time high of 33.34 billion miles (Figure 1-2).

The state's 1984 traffic fatality rate of 2.28 deaths per 100 million vehicle miles of travel continued below the national rate of 2.70 for the year. The state rate thus represented the second lowest figure in this category since 1969, exceeded only by the record low of 2.18 recorded for 1983 (Figure 1-3). Total reported motor vehicle traffic collisions and injuries increased over 1983. Total collisions were up 4.7% while the number of persons injured rose by 5.2% (Figure 1-4).

Collisions by Type

A 5.1% increase in multiple vehicle collisions over 1983 was recorded in 1984 (Figure 1-5). Similarly, single vehicle collisions were up 4.9% (Figure 1-6). In contrast, vehicle-pedestrian collisions dropped 2.3% from 1983 (Figure 1-7) while vehicle-pedalcyclist collisions experienced an even sharper decline of 4.6% (Figure 1-8). The greatest drop occurred in the category of fatal vehicle-pedalcyclist collisions. Here, 21.4% fewer such collisions were recorded in 1984 than in the previous year (Table 1-4).

Highways, Travel and Fatalities

The interstate system continued to be the most-traveled road system in the state in 1984, recording 8.319 billion miles, up from the 8.053 billion miles of 1983. This system's death rate, already the lowest in the state, declined even further from 0.92 in 1983 to 0.73 per 100 million vehicle miles in 1984.

City streets, second only to the interstate system in vehicle miles traveled in 1984, likewise posted a decline in the death rate. Motorists rolled up 7.953 billion vehicle miles in the cities while recording a death rate of 1.42, down from 1.51 in 1983 and 1.67 in 1982. U.S. numbered routes fared less favorably, posting a 3.31 death rate, up from the previous year's 1.86 as state numbered routes also recorded an increase from 1983's 2.68 to 1984's 3.07. County roads were traveled 6.579 billion miles and recorded a death rate of 3.78 in 1984, a decline from the previous year's 3.99 rate. Total motor vehicle travel in the state increased from 32.275 billion miles to 33.344 billion (Table 1-5).

Figure 1-1

TRAFFIC DEATHS 1974-1984

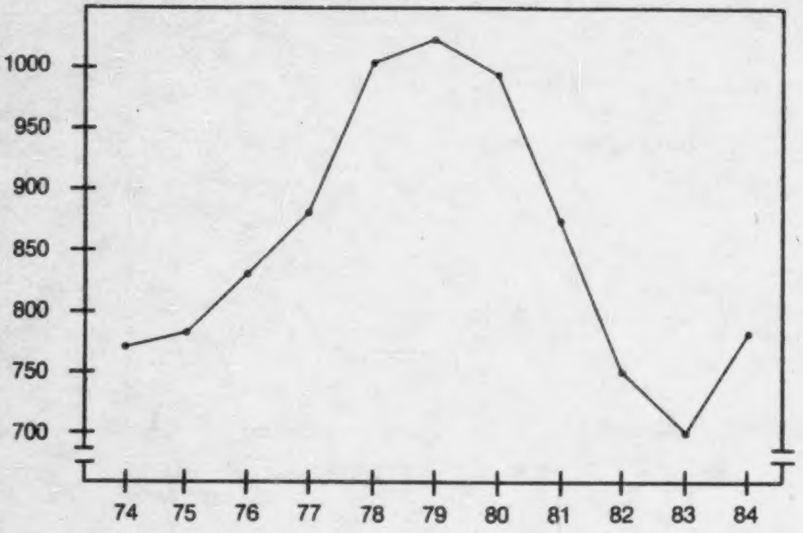


Figure 1-2

MILES TRAVELED (in billions)

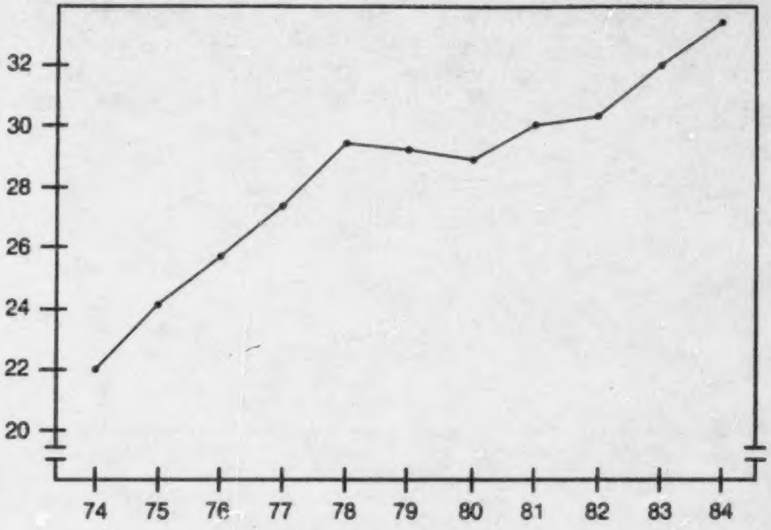


Figure 1-3

DEATH RATE
(per 100 million vehicle miles)

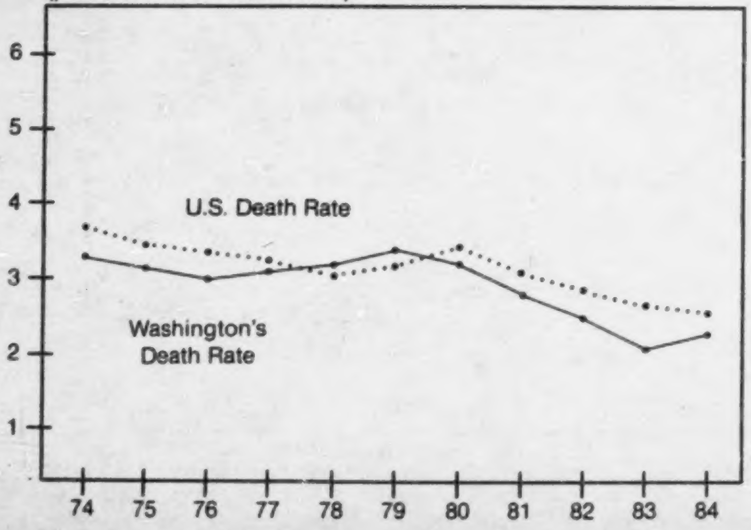
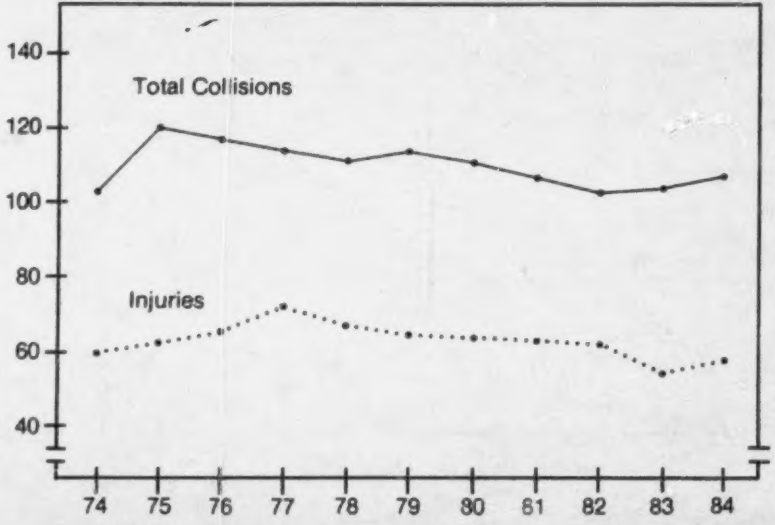


Figure 1-4

TOTAL REPORTED MOTOR VEHICLE TRAFFIC COLLISIONS AND INJURIES (in thousands)



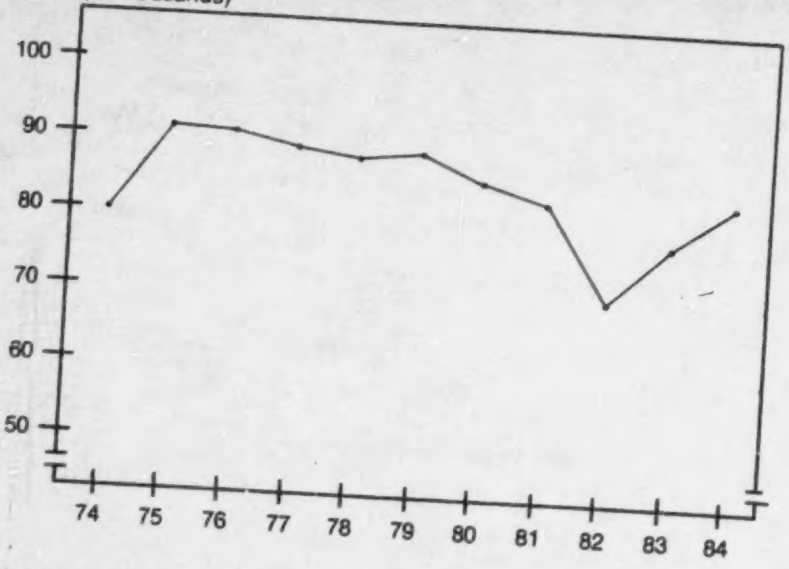


Figure 1-5
MULTIPLE VEHICLE COLLISIONS
(in thousands)

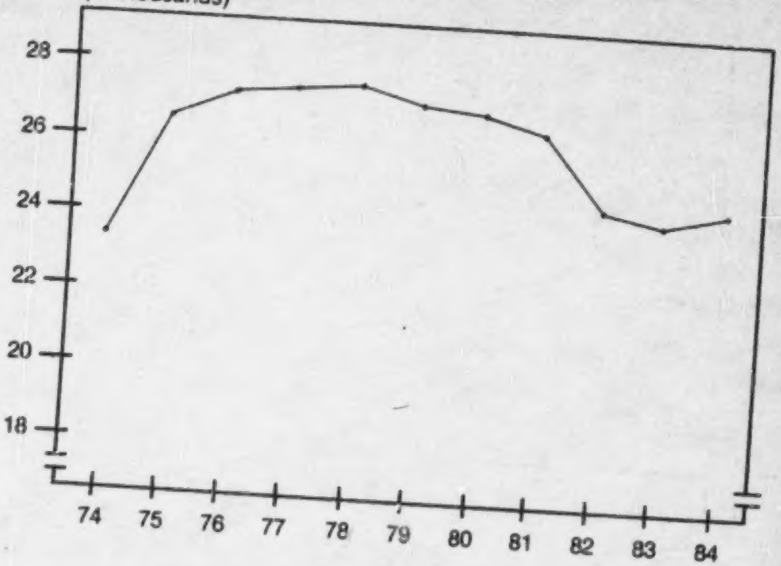


Figure 1-6
SINGLE VEHICLE COLLISIONS
(in thousands)

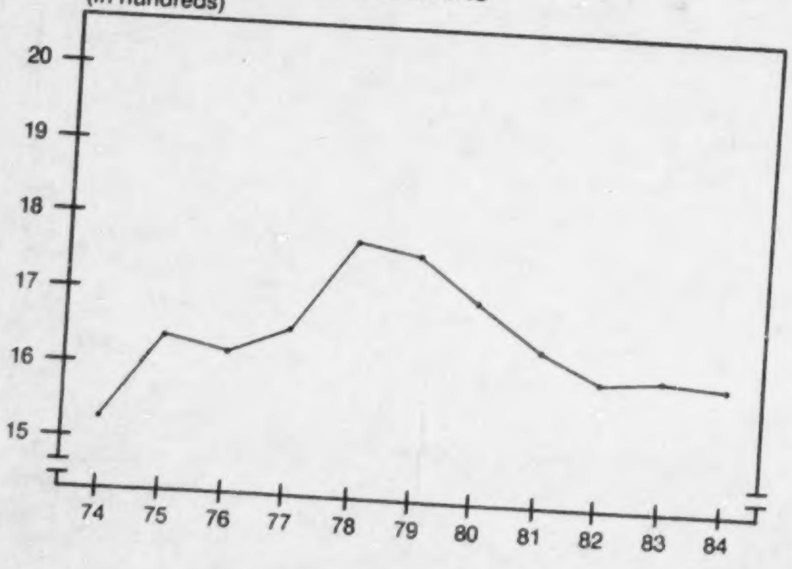


Figure 1-7
VEHICLE-PEDESTRIAN COLLISIONS
(in hundreds)

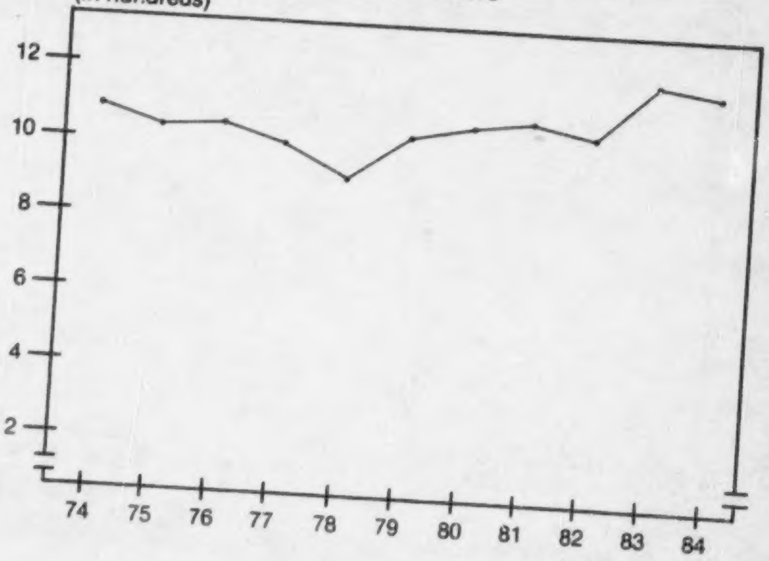
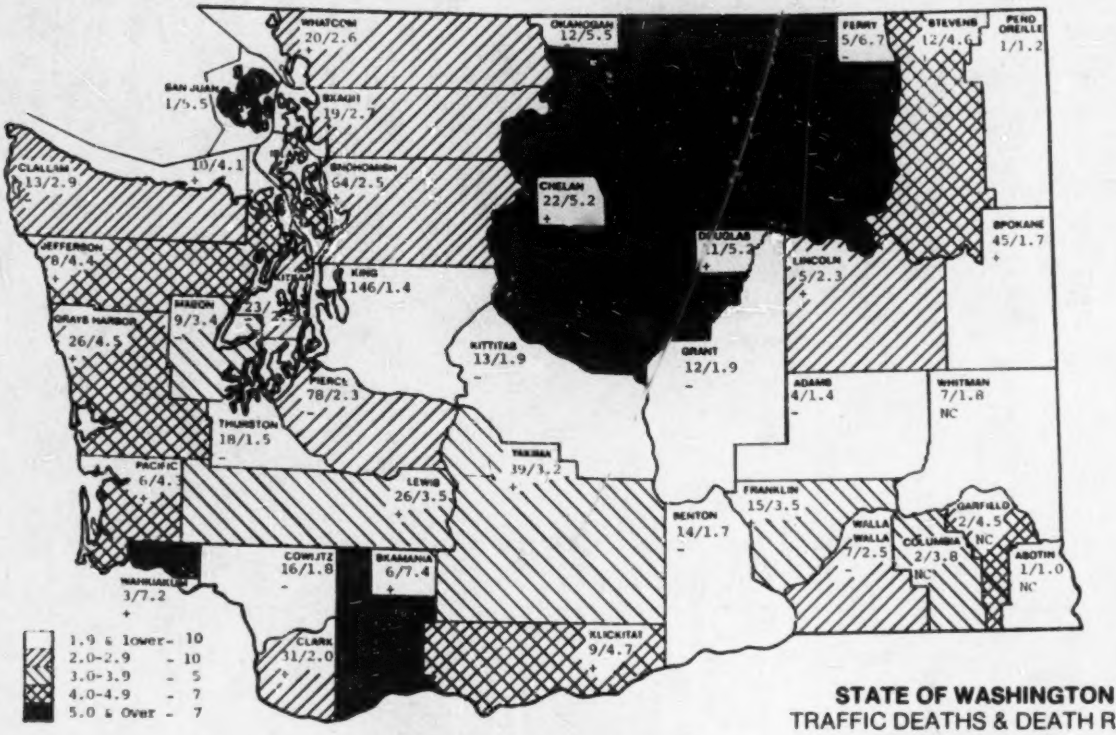


Figure 1-8
VEHICLE-PEDALCYCLIST COLLISIONS
(in hundreds)

Figure 1-9


WHATCOM
20/2.6
+
OKANOGAN
12/5.5
-
FERRY
5/6.7
-
STEVENS
12/4.6
+
PEND OREILLE
1/1.2
SAN JUAN
1/5.5
SKAGIT
19/2.7
CLALLAM
13/2.9
10/4.1
+
SNOHOMISH
64/2.5
+
CHELAN
22/5.2
+
DOUGLAS
11/5.2
+
SPOKANE
45/1.7
+
JEFFERSON
8/4.4
+
KITSAP
23/
2.
KING
146/1.4
LINCOLN
5/2.3
+
MASON
9/3.4
-
GRAYS HARBOR
26/4.5
+
KITTITAS
13/1.9
-
GRANT
12/1.9
-
PIERCE
78/2.3
-
ADAMS
4/1.4
-
WHITMAN
7/1.8
NC
THURSTON
18/1.5
-
YAKIMA
39/3.2
+
PACIFIC
6/4.3
+
LEWIS
26/3.5
+
FRANKLIN
15/3.5
GARFIELD
2/4.5
NC
BENTON
14/1.7
-
WALLA WALLA
7/2.5
-
COLUMBIA
2/3.8
NC
ASOTIN
1/1.0
NC
COWLITZ
16/1.8
-
SKAMANIA
6/7.4
+
WAHKIAKUM
3/7.2
+
CLARK
31/2.0
+
KLICKITAT
9/4.7
+
1.9 & lower- 10
2.0-2.9 - 10
3.0-3.9 - 5
4.0-4.9 - 7
5.0 & Over - 7

STATE OF WASHINGTON
TRAFFIC DEATHS & DEATH RATE
By County — 1984
Statewide Death Rate 2.3

Traffic Deaths/Death Rate
761/2.3
- = fewer traffic deaths than 1983
+ = more traffic deaths than 1983

Table 1-5

HIGHWAYS, TRAVEL AND FATAL ACCIDENTS — 1984

Type of Highways	Miles of Highway	Percent of Total Highways	Veh. Miles Traveled (Millions)	Percent of Total Veh. Mi. Traveled	Total Collisions	Number Killed	*Death Rate Per CMVM
Interstate System**	706	.83	8,319	24.95	9,444	61	0.73
U.S. Numbered Routes	1,592	1.88	2,838	8.51	4,730	94	3.31
State Numbered Routes	4,662	5.50	7,582	22.74	20,276	233	3.07
County Roads	41,351	48.78	6,579	19.73	24,620	249	3.78
City Streets	10,110	11.93	7,953	23.85	51,836	113	1.42
All Other Traffic Ways	26,349	31.08	73	.22	749	11	—
TOTAL	84,770	100.00	33,344	100.00	111,655	761	2.28

*Fatalities per hundred million vehicle miles, based on roadway travel as reported by the Department of Transportation.
*Does not include traveled way.

Figure 1-10

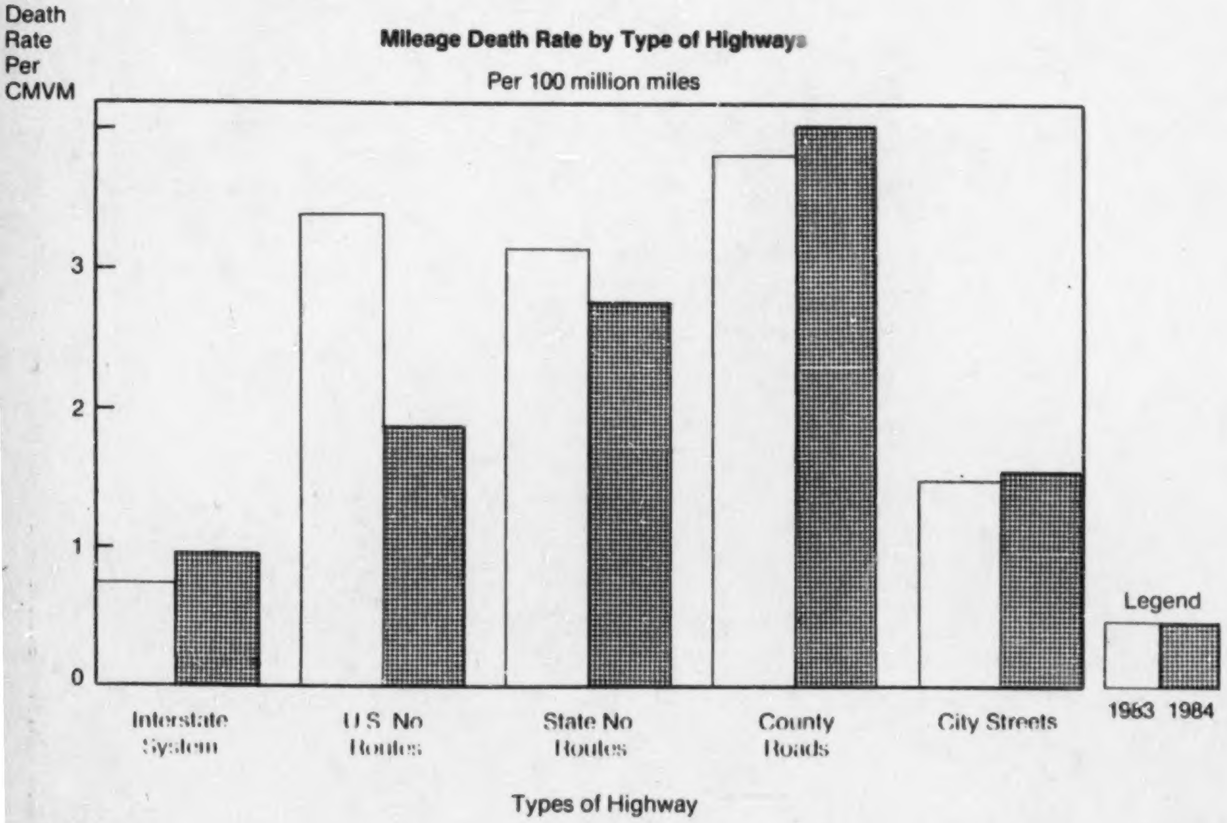


Figure 1-11

Traffic Fatalities In 1984 and Percent Change from 1983

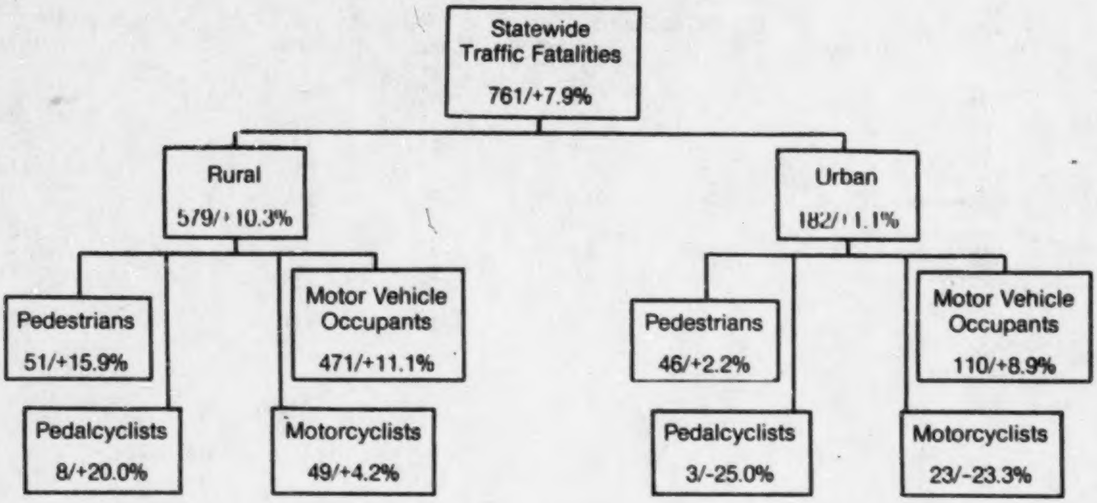

Statewide Traffic Fatalities
761/+7.9%
Rural
579/+10.3%
Urban
182/+1.1%
Pedestrians
51/+15.9%
Motor Vehicle Occupants
471/+11.1%
Pedalcyclists
8/+20.0%
Motorcyclists
49/+4.2%
Pedestrians
46/+2.2%
Motor Vehicle Occupants
110/+8.9%
Pedalcyclists
3/-25.0%
Motorcyclists
23/-23.3%

Figure 1-12

Traffic Fatalities by Age and Sex

1984

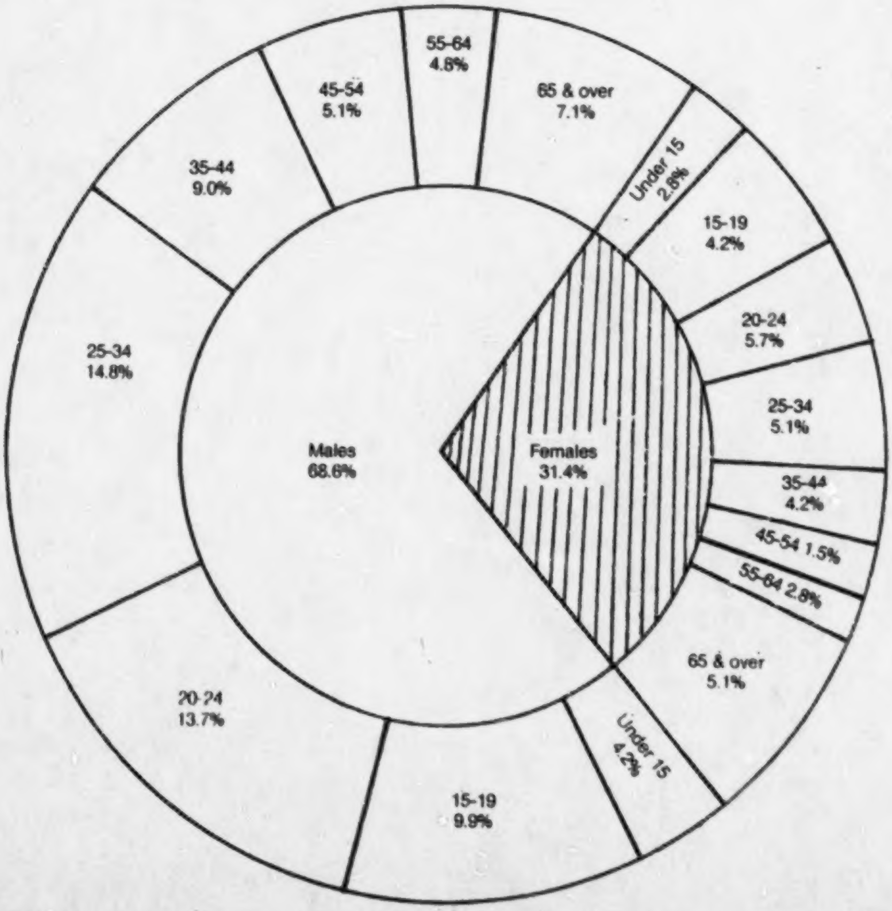


Table 1-6

PERSONS KILLED AND INJURED BY AGE BY STATUS
1984

	Total		Occupants		Pedestrians		Pedalcyclists	
Age	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
0 - 4	14	1,087	6	992	8	75	0	19
5 - 9	17	1,583	10	1,192	6	215	1	174
10 - 14	22	2,018	12	1,460	8	194	2	360
15 - 19	107	10,369	100	9,910	6	215	1	241
20 - 24	147	11,154	138	10,862	9	167	0	122
25 - 34	151	14,079	133	13,671	18	255	0	148
35 - 44	100	8,013	89	7,848	8	126	3	35
45 - 54	50	4,409	46	4,270	4	121	0	17
55 - 64	57	3,337	45	3,237	11	89	1	8
65 - 74	47	2,126	39	2,024	6	89	2	12
75 & Older	46	1,154	32	1,071	13	80	1	2
Not Stated	3	2,037	3	1,905	0	84	0	41
TOTAL	761	61,365	653	58,442	97	1,710	11	1,179

Table 1-6a

COMPARISON OF TRAFFIC DEATHS IN WASHINGTON BY MONTH AND ACCUMULATED TOTALS — 1982, 1983, 1984

	1984		1983		1982		Percent of Change 1984 to 1983	
Month	Month	Year To Date	Month	Year To Date	Month	Year To Date	Month	Year to Date
January	48	48	49	49	52	52	- 2.0%	- 2.0%
February	41	89	34	83	36	88	+ 20.6%	+ 7.2%
March	56	145	46	129	54	142	+ 21.7%	+ 12.4%
April	50	195	76	205	61	203	- 34.2%	- 4.9%
May	68	263	47	252	73	276	+ 44.7%	+ 4.4%
June	82	345	65	317	75	351	+ 26.2%	+ 8.8%
July	83	428	73	390	76	427	+ 13.7%	+ 9.7%
August	75	503	67	457	75	502	+ 11.9%	+ 10.1%
September	63	566	64	521	92	594	- 1.6%	+ 8.6%
October	76	642	59	580	66	660	+ 28.8%	+ 10.7%
November	72	714	67	647	55	715	+ 7.5%	+ 10.4%
December	47	761	58	705	42	757	- 19.0%	+ 7.9%

Table 1-7

Collision Rates By County Population — 1984

County	1984 Population	Traffic Deaths	Death Rate*	No. of Injuries	Injury Rate**	Total Collisions	Collision Rate**
Over 1,000,000 Population							
1. King	1,326,600	146	11.00	21,169	15.95	40,487	30.52
250,000 to 500,000 Population							
1. Pierce	514,600	78	15.16	8,259	16.05	13,941	27.09
2. Snohomish	366,700	64	17.45	4,858	13.25	8,511	23.21
3. Spokane	349,400	45	12.88	5,589	16.00	9,306	26.63
100,000 to 250,000 Population							
1. Clark	201,700	31	15.37	2,578	12.78	4,135	20.50
2. Yakima	180,000	39	21.67	2,155	11.97	4,390	24.39
3. Kitsap	162,500	23	14.15	1,902	11.70	3,386	20.84
4. Thurston	136,200	18	13.22	1,795	13.18	3,381	24.82
5. Whatcom	113,700	16	14.07	1.377	12.11	2,526	22.22
6. Benton	107,700	14	13.00	994	9.23	2,189	20.32
50,000 to 100,000 Population							
1. Cowlitz	79,900	16	20.02	972	12.16	1,825	22.84
2. Skagit	66,800	19	28.44	934	13.98	1,640	24.55
3. Grays Harbor	65,100	26	39.94	869	13.35	1,663	25.55
4. Lewis	56,600	26	45.94	796	14.06	1,372	24.24
5. Clallam	52,900	13	24.57	563	10.64	1,069	20.21
25,000 to 50,000 Population							
1. Grant	49,500	12	24.24	478	9.66	920	18.59
2. Walla Walla	48,500	7	14.43	626	12.91	1,118	23.05
3. Island	47,800	10	20.92	433	9.06	698	14.60
4. Chelan	47,500	22	46.32	604	12.72	1,346	28.34
5. Whitman	39,700	7	17.63	419	10.55	717	18.06
6. Franklin	36,300	15	41.32	508	13.99	897	24.71
7. Mason	34,800	9	25.86	368	10.57	728	20.92
8. Okanogan	31,900	12	37.62	387	12.13	680	21.32
9. Stevens	30,100	12	39.87	304	10.10	529	17.57
10,000 to 25,000 Population							
1. Kittitas	25,000	13	52.00	462	18.48	997	39.48
2. Douglas	22,600	11	48.67	244	10.80	415	18.36
3. Pacific	17,700	6	33.90	186	10.51	338	19.10
4. Jefferson	17,000	8	47.06	249	14.65	408	24.00
5. Asotin	16,900	1	5.92	119	7.04	233	13.79
6. Klickitat	16,500	9	54.54	196	11.88	320	19.39
7. Adams	13,700	4	29.20	251	18.32	376	27.45
Under 10,000 Population							
1. Lincoln	9,800	5	51.02	142	14.90	202	20.61
2. Pend Oreille	9,100	1	10.10	125	13.74	180	19.78
3. San Juan	8,900	1	11.63	89	10.00	128	14.38
4. Skamania	7,900	6	75.95	103	13.04	186	23.54
5. Ferry	6,100	5	81.97	95	15.57	156	25.57
6. Columbia	4,100	2	48.78	65	15.85	111	27.07
7. Wahkiakum	3,800	3	78.95	56	14.74	80	21.05
8. Garfield	2,500	2	80.00	47	18.80	71	28.40
Total	4,328,100	761	17.58	61,366	14.18	111,655	25.80

*Frequency per 100,000 Population
**Frequency per 1,000 Population

Collision Rate By City Population — 1984

(Does not include collisions on state limited access roads or freeways)

City	1984 Population	Traffic Deaths	Death Rate*	No. of Injuries	Injury Rate**	Total Collisions	Collision Rate**
250,000 and over Population							
1. Seattle	490,300	45	9.2	8,489	17.31	17,329	35.34
100,000 to 250,000 Population							
1. Spokane	171,500	18	10.5	3,227	18.02	5,903	34.42
2. Tacoma	159,400	16	10.0	3,285	20.61	5,813	36.47
50,000 to 100,000 Population							
1. Bellevue	78,620	1	1.3	979	12.45	2,125	27.03
2. Everett	56,680	7	12.3	821	14.48	1,805	31.84
25,000 to 50,000 Population							
1. Yakima	49,340	5	10.1	860	17.43	1,957	39.66
2. Bellingham	46,010	4	8.7	537	11.67	1,223	26.53
3. Vancouver	42,850	7	16.3	861	20.09	1,365	31.85
4. Kennewick	37,240	2	5.4	261	7.00	843	22.64
5. Bremerton	33,970	3	8.8	541	15.93	1,148	33.79
6. Renton	33,340	3	9.0	608	18.24	1,292	38.75
7. Richland	31,660	1	3.2	309	9.76	610	19.27
8. Longview	29,820	2	6.7	409	13.72	863	28.94
9. Auburn	29,170	2	6.9	446	15.29	800	27.42
10. Olympia	28,790	1	3.5	480	16.67	1,086	37.72
11. Edmonds	27,880	1	3.6	274	9.83	543	19.48
12. Redmond	27,340	1	3.7	298	10.90	689	25.20
13. Kent	26,250	6	22.9	711	27.09	1,190	45.33
14. Walla Walla	25,640	0	—	311	12.13	646	25.19
15,000 to 25,000 Population							
1. Lynnwood	23,139	1	4.3	500	21.62	944	40.81
2. Pullman	22,770	0	—	92	4.04	257	11.29
3. Mercer Island	20,910	1	4.8	69	3.30	194	9.28
4. Pasco	18,930	3	15.8	268	14.16	558	29.48
5. Kirkland	18,670	1	5.4	185	9.91	498	26.67
6. Puyallup	18,600	1	5.4	316	16.99	566	30.43
7. Aberdeen	17,400	1	5.7	172	9.88	555	31.90
8. Wenatchee	17,330	1	5.8	178	10.27	568	32.78
9. Port Angeles	17,220	1	5.8	183	10.63	437	25.38
10. Mountlake Terrace	16,020	0	—	111	6.93	266	16.60
10,000 to 15,000 Population							
1. Lacey	14,520	0	—	151	10.40	332	22.86
2. Mount Vernon	13,730	1	7.3	187	13.62	401	29.20
3. DesMoines	13,100	0	—	144	10.99	233	17.78
4. Oak Harbor	12,210	0	—	100	8.19	184	15.07
5. Centralia	11,770	1	8.5	129	10.96	323	27.44
6. Ellensburg	11,590	0	—	72	6.21	200	17.26
7. Kelso	10,840	0	—	143	13.19	286	26.38
8. Moses Lake	10,350	0	—	105	10.14	275	26.57
Statewide urban (Less Urban freeways)	2,165,585	155	7.2	28,887	13.34	59,530	27.49

*Frequency per 100,000 population
**Frequency per 1,000 population

EXPLANATION OF PROBLEM ANALYSIS PROCESS

Explanation of Problem Analysis Process

In developing the Problem Identification section for the 1986 Highway Safety Plan (HSP), problem areas were classified into two basic types: impact problems and system support problems.

Impact problems are those whose factors contribute directly to the occurrence of accidents, fatalities and/or injuries and may be corrected through the implementation of countermeasures designed to reduce the effects of these factors.

System support problems are those deficiencies within vital traffic safety programs whose correction may not be directly reflected in a reduction in traffic accidents, injuries or fatalities.

The basis for impact and system support problem identification, analysis and selection for inclusion into the HSP was done in two ways.

1. Impact problem areas were based on identifying statewide experience in impact areas (where information was available) outlined in the Federal safety standards. Various statewide automated and manual traffic information systems were inventoried and analyzed. The data sources included: Traffic Accident Records, Fatal Accident Reporting System, Driver's Licensing Records, Vehicle Registration Records and Highway/Roadway Information. In most instances, four years' worth of data were gathered as a baseline to serve as a point of comparison to the current year's activity level.
2. The second source for problem identification inclusion in the HSP resulted from analysis by and for various state and local agencies with an interest in highway safety. The Washington Traffic Safety Commission made it known that the two main emphasis areas in FY 1986 were the non-use of occupant restraint systems, and alcohol-related crashes.

Data Analysis and Statistical Techniques

Data analysis was a key factor in the identification and selection of the traffic problem areas included in this Plan. The analyses were performed to ensure that the conclusions drawn from the data were valid and credible.

The most common data sources in the HSP were the statewide traffic accident records, which were used for identifying the specific traffic problem areas. Four continuous years (1980-1983) of crash experience were used to serve as a baseline in analyzing traffic accident data. This baseline was used to obtain a better perspective to assess the current year's (1984) experience with traffic problem areas. The baseline also serves to negate short-term changes in crash patterns.

The development of over/under-representation ratios were the most frequently used methods of analysis. Where relevant exposure data were available, the generation of over-representation ratios allow for the comparisons of different subgroups relative to the percentage of the population they comprise. Additionally, county and city rankings were generated for different problem areas to compare geographical and political subdivisions.

ANALYSIS OF SELECTED TRAFFIC PROBLEMS

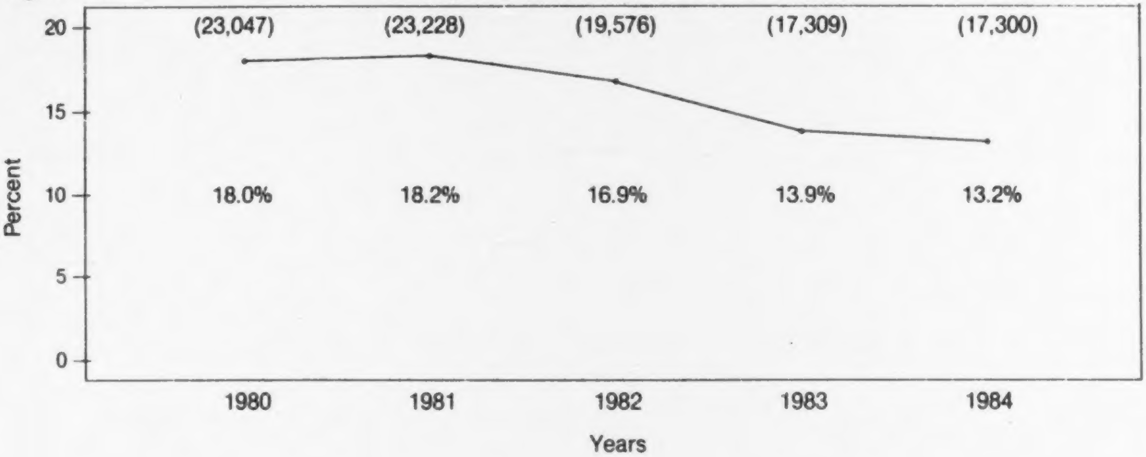
- Alcohol Involvement
- Youth Involvement
- Safety Restraint Usage
- Motorcycle Collisions
- Pedalcycles
- Pedestrians
- Heavy Trucks
- Pupil Transportation
- Contributory Driver Violations
- Vehicle Defects

ALCOHOL INVOLVEMENT

Overview

In 1984, 13.2% of all drivers involved in traffic collisions had been drinking alcohol. This is a 5% decrease from 1983 and continues a three-year downward trend reversing the 1980 to 1981 figure showing an increase in the number of drivers who had been drinking (Figure 2-1).

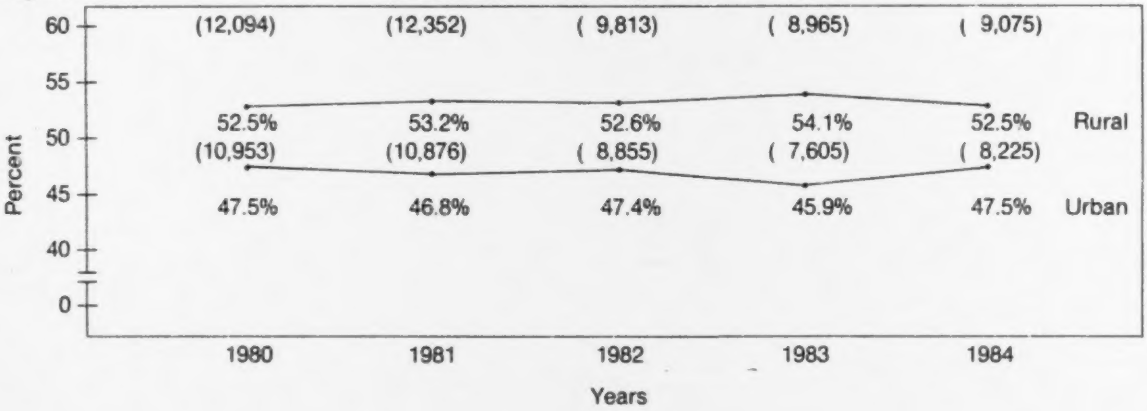
Figure 2-1 **Alcohol Involvement of Drivers in Total Collisions**



Location of Alcohol Related Collisions

In 1984 the urban-rural breakdown of alcohol-related collisions shifted slightly with a decrease in rural areas and an increase in the urban areas compared to 1983; 52.5% of the alcohol-related collisions occurred in rural areas and 47.5% in urban areas (Figure 2-2).

Figure 2-2 **Alcohol Related Collisions by Urban and Rural Areas**



The predominant type of alcohol-related vehicle collisions continued to be multiple-vehicle mishaps in urban areas (Figure 2-3) with the opposite holding true in rural areas (Figure 2-4). Of the urban collisions, 64.8% involved two or more vehicles while only 34.6% were multiple vehicle crashes on rural roads.

Figure 2-3 **Urban areas, percentage of single vs. multiple alcohol involved Vehicle Collisions**

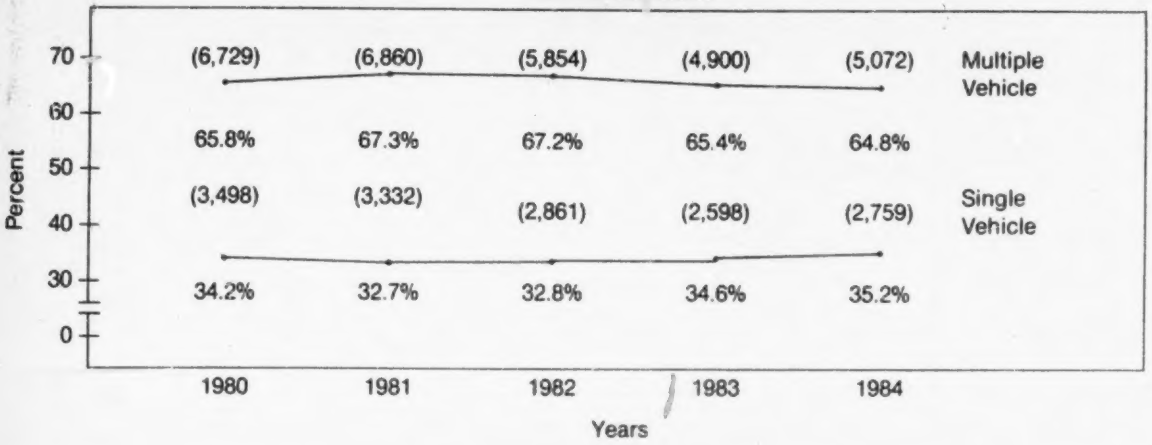
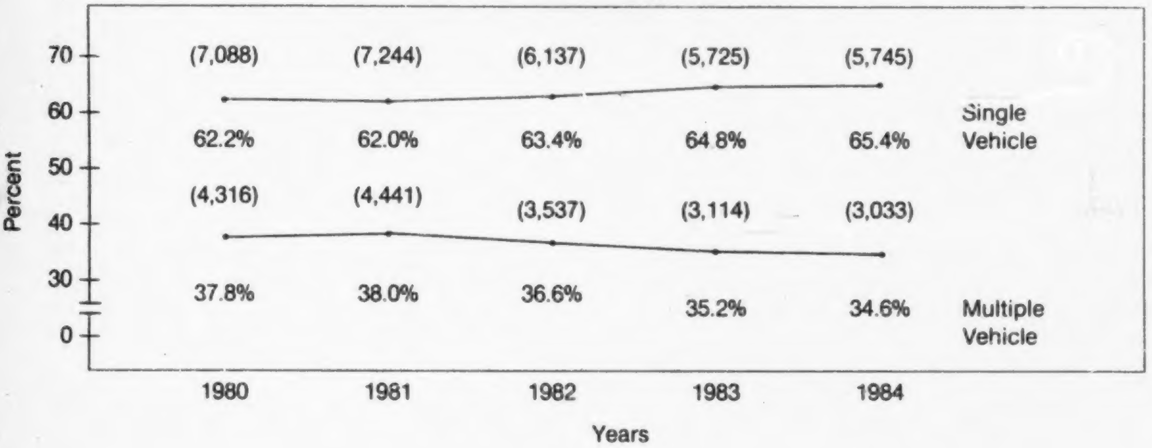


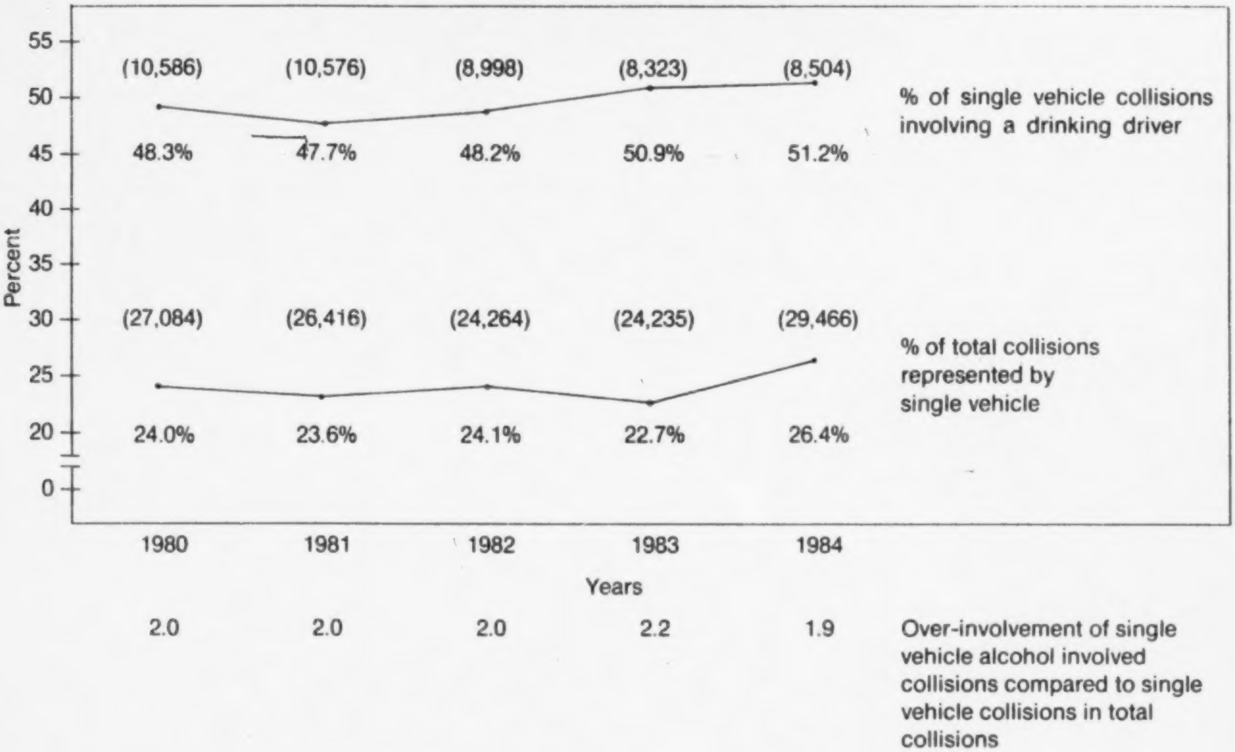
Figure 2-4 **Rural areas, percentage of single vs. multiple alcohol related Vehicle Collisions**



Single Vehicle Accidents Involving Alcohol

In 1984 the percentage of all single vehicle accidents where the driver had been drinking remained relatively stable at nearly 50% of the total single vehicle accidents. The percentage of total accidents that the single vehicle accident represents reached a new high of 26.4% in 1984 compared to the percentages for the years 1980 through 1983 (Figure 2-5). Comparing the percentage of alcohol involvement in single vehicle collisions to the percentage of total collisions the single vehicle collision represents allows for the generation of a ratio to express the over-representation of alcohol in single vehicle collisions. In 1984, this ratio decreased for the first time since 1980, declining to 1.9 from the previous year's 2.2.

Figure 2-5 **Alcohol Involvement in Single Vehicle Collisions Compared to the percent of Total Collisions Involving Single Collisions**



Drivers Involved in Fatal Collisions

In 1984, 39.2% of the drivers involved in statewide fatal collisions had been drinking intoxicants, a decline for the fifth straight year. The year 1984 registered 14.8% fewer drivers in this category than the four-year baseline period of 1980-83. In rural areas, 40.5% of the drivers in fatal accidents had been drinking, a 13.8% decline over the 1980-83 average. In urban areas, the figure was 35.3%, a 16% decrease from baseline (Table 2-1).

Table 2-1

SOBRIETY OF DRIVERS INVOLVED IN FATAL COLLISIONS

		Drivers Involved in Fatal Collisions						
	Condition of Driver (Sobriety)	**1980**	**1981**	**1982**	**1983**	**Prev. 4 Yr. Average**	**1984**	**Change 84 - 4 Yr. Avg.**
STATEWIDE	Had been drinking - ability impaired	437	364	333	260	349	307	- 12.0%
	Had been drinking - ability not impaired	62	74	39	37	53	52	- 1.9%
	Had been drinking - sobriety unknown	69	68	51	31	55	11	- 80.0%
	Had not been drinking	584	556	489	502	533	574	+ 7.7%
	Not stated	94	71	49	62	69	41	- 41.0%
	Total drivers	1,246	1,133	961	892	1,058	985	- 6.9%
	Total drivers drinking	569	506	423	328	457	370	- 19.0%
	Total drivers - excluding not stated	1,152	1,062	912	832	990	944	- 4.6%
	No. drinking drivers per 100 involved	49.4	47.6	46.4	39.4	46	39.2	- 14.8%
	No. of drunk drivers per 100 involved	37.9	34.3	36.5	31.3	35	32.5	- 7.1%
RURAL	Had been drinking - ability impaired	328	291	265	198	271	246	- 9.2%
	Had been drinking - ability not impaired	47	57	28	28	40	35	- 12.5%
	Had been drinking - sobriety unknown	48	46	36	24	39	6	- 84.6%
	Had not been drinking	419	406	362	360	387	422	+ 9.0%
	Not stated	44	33	21	32	33	24	- 27.2%
	Total drivers	886	833	712	642	768	733	- 4.6%
	Total drivers drinking	423	394	329	250	349	287	- 17.8%
	Total drivers - excluding not stated	842	800	691	610	736	709	- 3.7%
	No. drinking drivers per 100 involved	50.2	49.3	47.6	41.0	47.0	40.5	- 13.8%
	No. of drunk drivers per 100 involved	39.0	36.4	38.4	32.5	37.0	34.7	- 6.2%
URBAN	Had been drinking - ability impaired	109	73	68	62	78	61	- 21.8%
	Had been drinking - ability not impaired	15	17	11	9	13	17	+ 30.8%
	Had been drinking - sobriety unknown	21	22	15	7	16	5	- 68.8%
	Had not been drinking	165	150	127	142	146	152	+ 4.1%
	Not stated	50	38	28	30	37	17	- 54.0%
	Total drivers	360	300	249	250	290	252	- 13.1%
	Total drivers drinking	145	112	94	78	107	83	- 22.4%
	Total drivers - excluding not stated	310	262	221	220	253	235	- 7.1%
	No. drinking drivers per 100 involved	46.8	42.7	42.5	35.5	42.0	35.3	- 16.0%
	No. of drunk drivers per 100 involved	35.2	27.9	30.8	28.2	31.0	26.0	- 16.1%

Alcohol Involvement by Age Group

Drivers under 30 years of age continue to be over-represented in alcohol-related collisons. The 16-20 year old group comprised 8% of all licensed drivers in the state in 1984 but were involved in 17.7% of all alcohol-related accidents. This was an over-representation ratio of 2.2, meaning this age group was involved in 2.2 times more alcohol-related accidents than the percentage of licensed drivers it represented (Figure 2-6). The over-involvement ratio for drivers aged 21-24 in 1984 was 2.5. This age group's over-involvement ratio has climbed steadily since 1981 (Figure 2-7). In 1984 the 25-29 year age group was involved in 1.45 times more alcohol-related accidents than the percentage of licensed drivers the group represented (Figure 2-8). The remaining age group, 30 years and older, was under-represented by a ratio of .58 last year (Figure 2-9).

Figure 2-6

16 - 20 Year Old Involvement in Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group

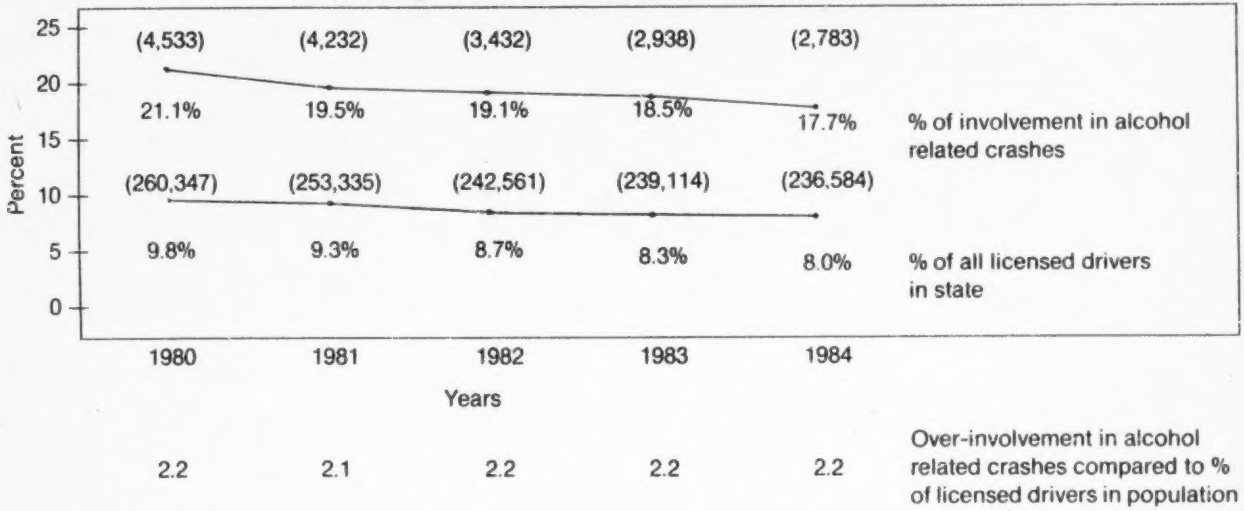


Figure 2-7

21 - 24 Year Old Involvement in Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group

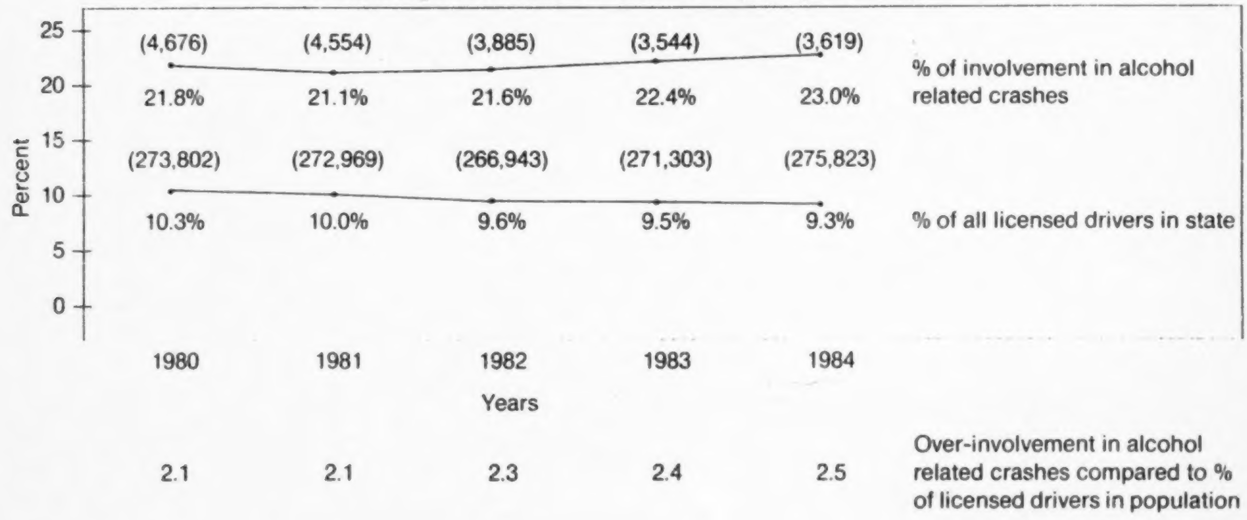


Figure 2-8

25 - 29 Year Old Involvement in Alcohol Related Crashes as a Percentage of all Licensed Drivers Comprising the Group.

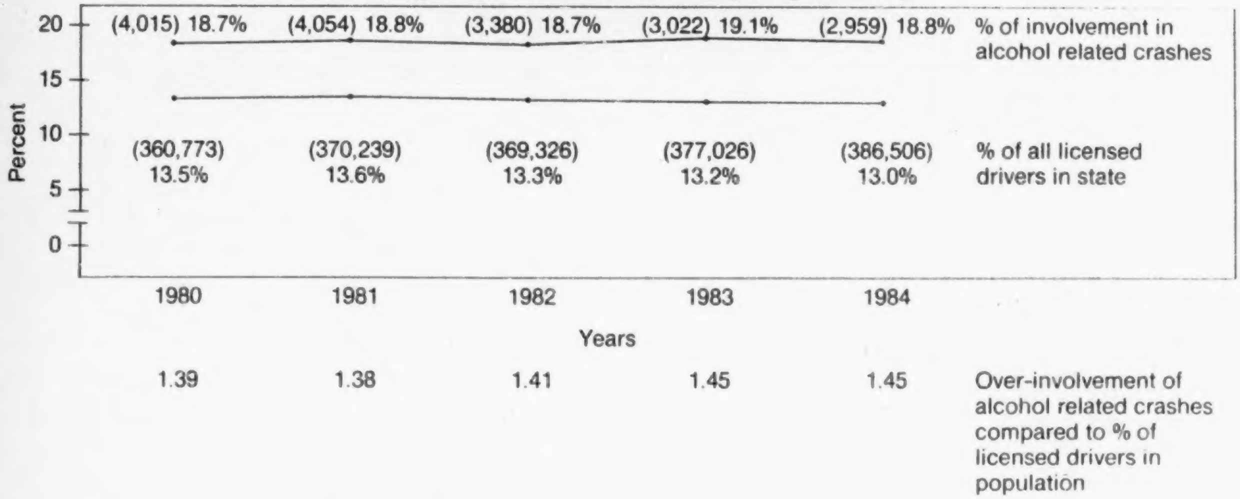
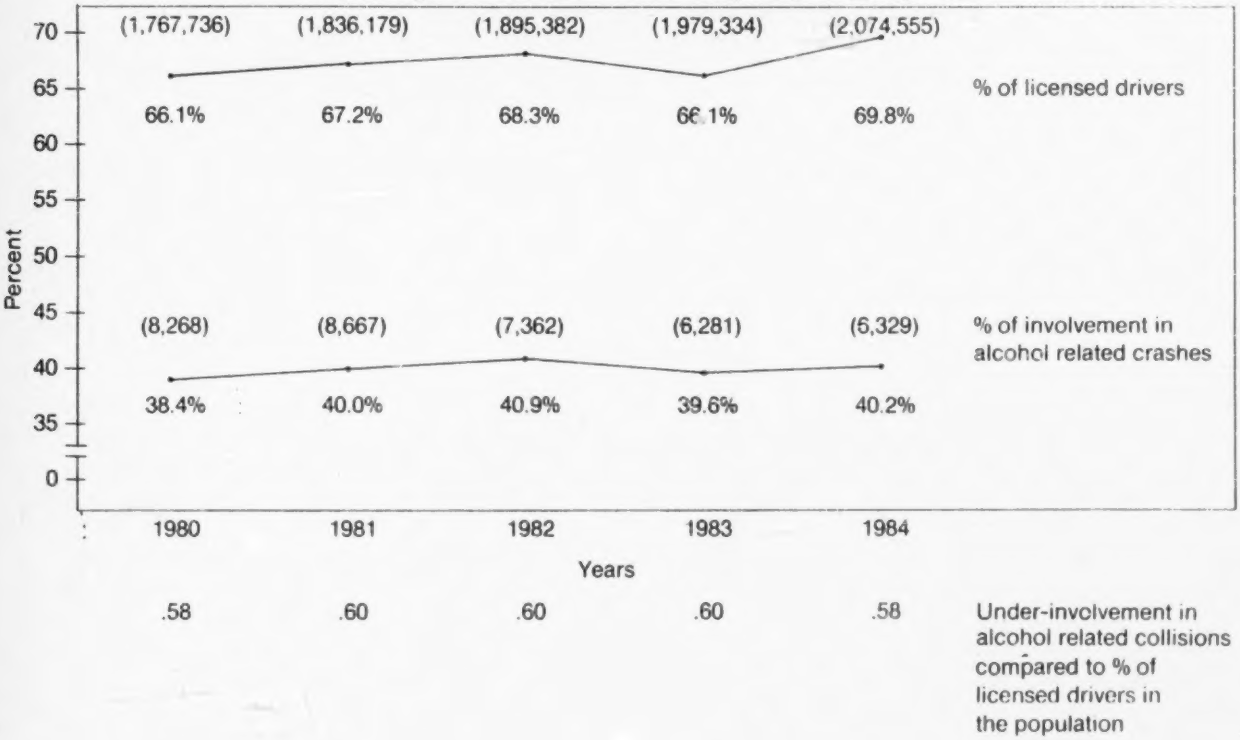


Figure 2-9

30 Year Old and Older Involvement in Alcohol Related Crashes as a Percentage of All Licensed Drivers Comprising the Group



Weekend Alcohol Involvement

In 1984 the percentage of alcohol-related weekend collisions occurred at a rate 1.7 times greater than all weekend collisions (Friday 6 P.M. to Sunday midnight). This was the same over-representation ratio registered for 1983 (Figure 2-10). In a further breakdown of weekend alcohol-related collisions comparing the percentage of alcohol involved collisions occurring Friday and Saturday between the hours of 8 p.m. to 3 a.m. (select time period) to the percentage of the total week's accidents occurring in this time frame, the alcohol-related collisions are 2.8 times over-represented. This remains unchanged from the previous year (Figure 2-11).

Figure 2-10 **Alcohol Involvement in Weekend Collisions Compared to the Percentage of all Weekend Collisions**

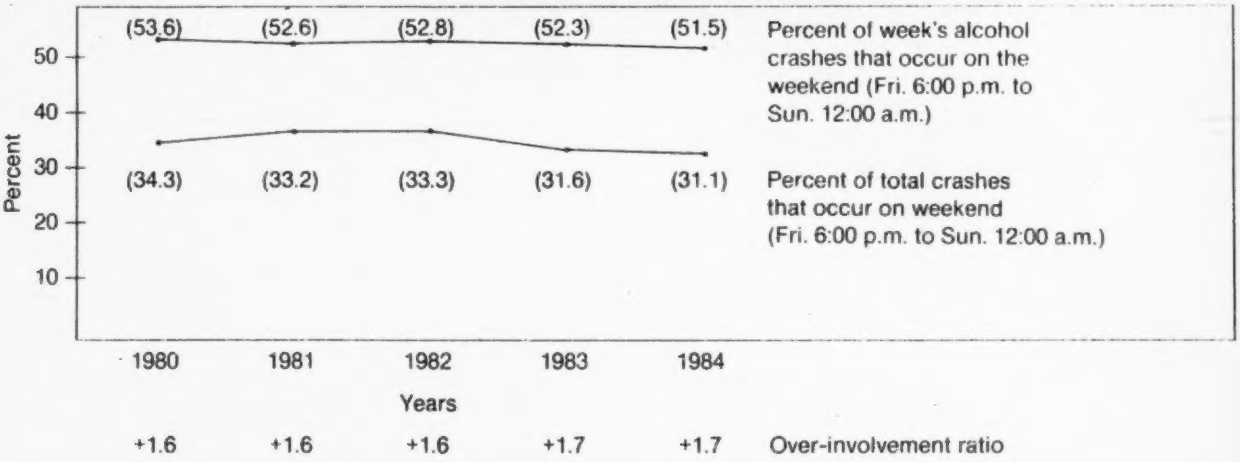
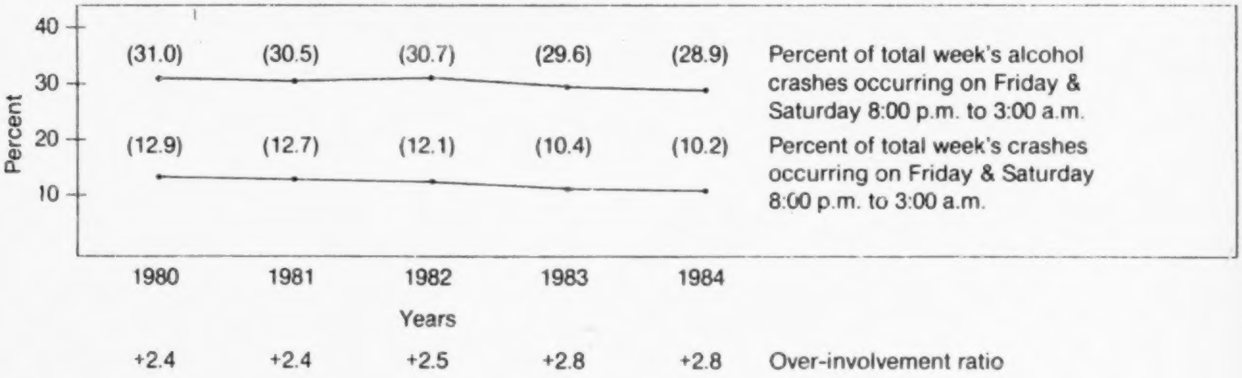


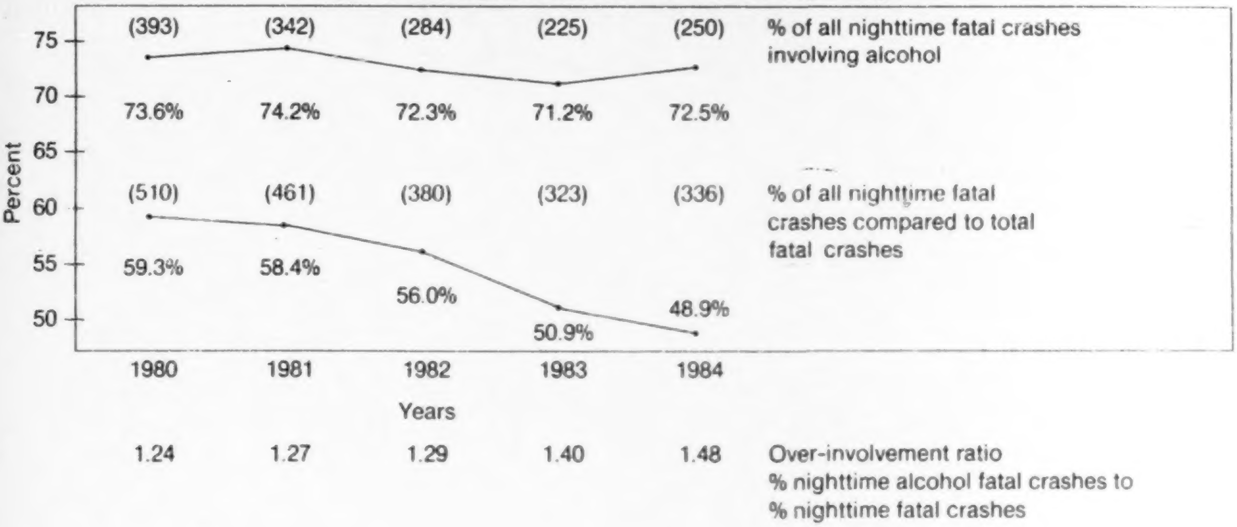
Figure 2-11 **Alcohol Involved Collisions Occurring in the Select Time Period (Friday and Saturday Between 8 P.M. and 3 A.M.) to the Percentage This Time Period Contributes to the Total Week's Collisions**



FATAL ALCOHOL INVOLVED CRASHES OCCURRING AT NIGHT

The number of all nighttime fatal crashes involving alcohol expressed as a percentage of all nighttime fatal accidents has remained relatively stable over the past five years. All nighttime fatal accidents in 1984 comprised 48.9% of the year's total fatal crashes. In 1984 alcohol-related fatal accidents at night were over-represented when compared to all nighttime fatal crashes by a ratio of 1.48, which continues a steady upward trend from 1980 (Figure 2-12).

Figure 2-12 **Fatal Alcohol Involved Crashes Occurring at Night Compared to the Percentage of All Fatal Crashes Occurring at Night.**



RATIO OF DRINKING AND DRUNK DRIVERS INVOLVED IN TRAFFIC COLLISIONS

Slightly over 39% of all drivers involved in fatal collisions in 1984 had been drinking prior to the crash. This marked the fourth consecutive year of decline in this category following 1980's 49.4% high (Figure 2-13). A little more than 13% of the drivers involved in all investigated accidents had been drinking prior to the collision. The 1984 drinking driver total of 17,300 represents a 16.8% decline from the previous four-year average (Figure 2-14).

Ratio of Drinking and Drunk Drivers Involved In Traffic Collisions
1975 - 1984

Figure 2-13

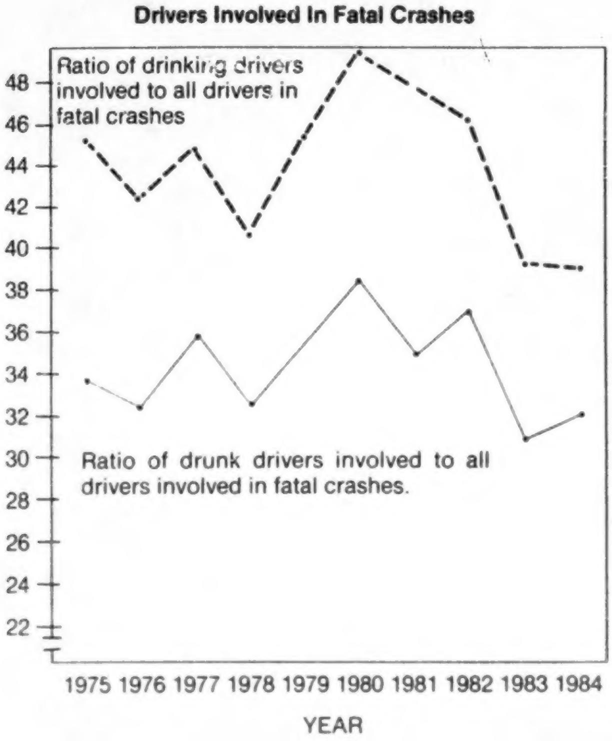
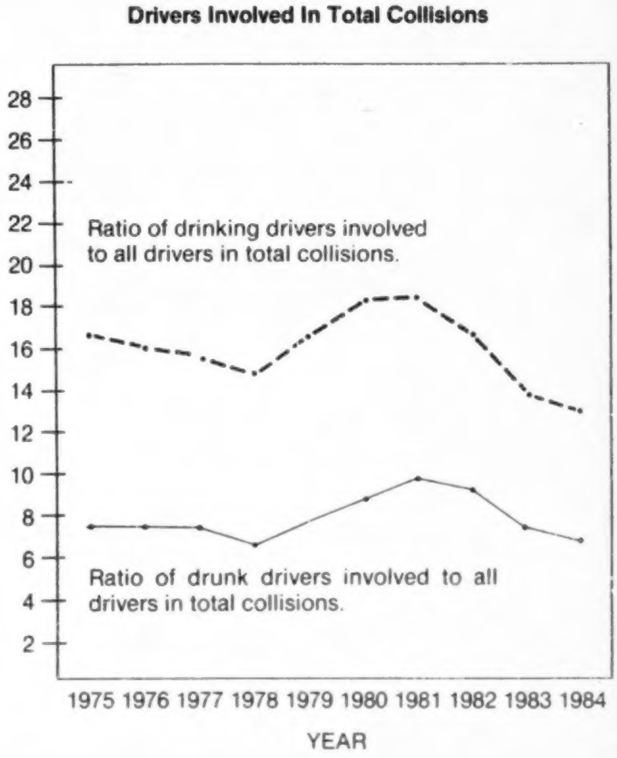


Figure 2-14



The total frequency of particular blood alcohol concentration (BAC) levels in fatal and serious injury collisions from 1980 through 1984 by age groups is presented in Table 2-2. The 16-19 and 20-24 age groups evidenced the greatest incidence of involvement for .00-.15 BAC levels. At the .16-.20 BAC range, the 20-24 age groups had the greatest frequency of occurrences. Overall, the 16-19, 20-24, and 25-29 age groups display the highest incidence of involvement at all BAC levels.

Table 2-2

Chemical Test for Intoxication in Fatal and Serious Injury Collisions for 1980, '81, '82, '83, '84

Age	.00-.05	.06-.10	.11-.15	.16-.20	.21-.25	.26-.30	.31 & Up	Test Given No Results	Test Refused	Total Tested
16-19	191	543	1,049	713	193	31	9	151	194	3,074
20-24	118	464	1,061	984	360	70	18	175	403	3,653
25-29	103	300	846	839	384	100	30	144	414	3,160
30-34	59	194	504	600	311	103	27	83	336	2,217
35-39	32	94	315	367	198	73	17	69	245	1,410
40-44	28	64	216	274	150	50	26	39	131	978
45-49	15	36	138	215	141	41	10	28	121	745
50-54	21	36	144	182	107	43	8	20	60	621
55-59	14	41	98	133	85	26	12	15	56	480
60-64	15	31	78	118	49	15	9	14	35	364
65-69	10	17	65	53	22	3	0	12	16	198
Over 69	13	15	43	41	16	7	0	6	11	152
TOTAL	619	1,835	4,557	4,519	2,016	562	166	756	2,022	17,052

An analysis of roadway type by day of week on which alcohol-involved fatal and serious injury collisions occurred is given in Table 2-3. County roads accounted for 33.5% of the total weekly collisions compared to 30.5% for city streets. U.S. and state routes totaled 25.5% while the interstates and full-control access roads together contributed 9.6% of the weekly total of fatal and serious alcohol-involved accidents during this period of time. The table also reveals that during 1984, Saturday was the weekday with the greatest frequency of fatal and serious injury accidents involving alcohol.

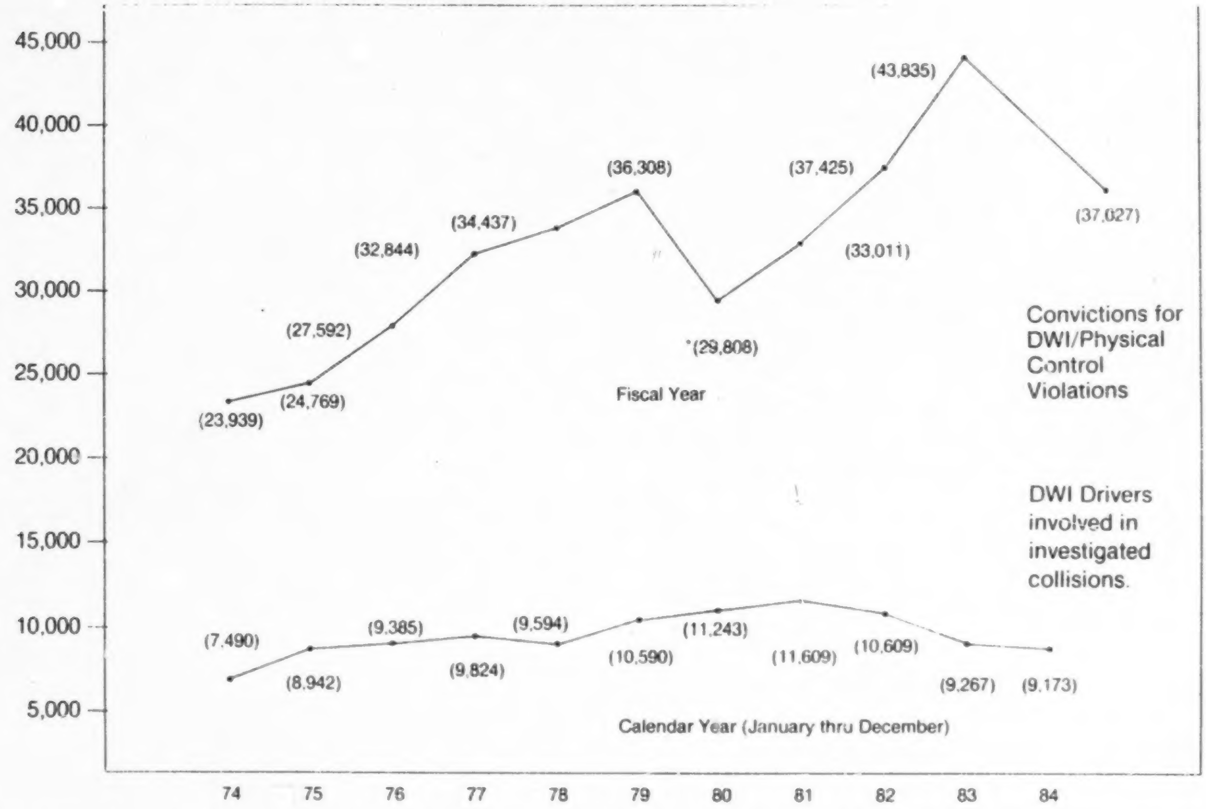
Table 2-3

Fatal and Serious Injury Collisions Involving Alcohol — 1984 Roadway Type by Day of Week

Roadway Type	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Row Total	Percentage of Total Weekly Collisions	Percentage of Previous 4 Year Average
County Roads	213	197	229	247	345	541	441	2,213	33.5%	33.2%
City Streets	210	190	242	242	292	487	355	2,018	30.5%	30.3%
U.S. & State Routes	169	146	167	183	280	419	322	1,686	25.5%	26.2%
Interstate & Full Control	54	57	78	81	75	169	121	635	9.6%	9.5%
Other Routes	2	1	7	4	10	22	15	61	0.9%	0.8%
TOTAL	648	591	723	757	1,002	1,638	1,254	6,613	100.0%	100.0%
Percent - 1984	9.8%	8.9%	10.9%	11.4%	15.2%	24.8%	19.0%	100.0%		
Percent - Previous 4 Year Average	8.8%	9.3%	10.1%	11.2%	16.1%	25.6%	18.9%	100.0%		

In 1984 the number of convictions for alcohol-related traffic offenses declined for the first time since 1980. The 37,027 convictions in 1984 for DWI/Physical Control violations represented a drop of 6,808 convictions from the record high year of 1983. In 1984 the number of DWI drivers involved in investigated collisions declined to 9,173, the third straight year the numbers in this category have dropped (Figure 2-15).

Figure 2-15 **Comparison of Convictions for DWI/Physical Control Violations and DWI Drivers Involved In Investigated Collisions 1974 - 1984**



*Convictions for physical control of vehicle while under the influence decreased from 10,520 in FY 1979 to 1,866 convictions in FY 1980. DWI convictions increased from 25,788 in FY 1979 to 27,942 in FY 1980.

Data for accident involvement by driver's age and percent of vehicle miles traveled for each age group reveal that the 16-17 year olds have the greatest over-representation in all reported accidents at 3.43:1. The 18-year-olds were the second most over-represented group. The age group with the greatest under-representation based on miles traveled was the 45-54 category. Those in the 21-year-old bracket displayed the greatest over-representation in alcohol-related collisions based on miles traveled. Second in this ranking was the 16-17 year old group. Two age groupings, the 45-54 and 55-64, tied at .41:1 each for the greatest under-representation in alcohol-involved accidents (Table 2-4).

Table 2-4

Comparison of Miles Traveled
All Reported Accidents & Alcohol Involved Accidents
By Age of Driver — 1984

Driver Age	Percent of Vehicle Miles Traveled*	Percent of All Accident Drivers**	Over/Under Representation Ratio	Percent of All Alcohol Involved Accidents	Over/Under Representation Ratio
16-17	1.95	6.68	3.43:1	4.28	2.19:1
18	1.97	4.19	2.13:1	4.05	2.06:1
19	2.31	4.09	1.77:1	4.59	1.99:1
20	2.74	4.10	1.50:1	4.99	1.82:1
21	2.31	3.93	1.70:1	6.02	2.61:1
22-24	8.38	10.57	1.26:1	14.80	1.77:1
25-34	27.40	26.78	.98:1	31.54	1.15:1
35-44	19.48	16.56	.85:1	15.15	.78:1
45-54	17.53	8.88	.51:1	7.18	.41:1
55-64	10.73	7.09	.66:1	4.45	.41:1
65 & Over	5.10	6.74	1.32:1	2.64	.52:1

*Source — National Accident Sampling System (NASS) — 1979-1980
**Source — Accident Records Unit — Washington State Patrol

Table 2-5 presents a summary of the number of persons killed and injured, number of property damage accidents, and total investigated accidents for drivers under the influence, all drinking drivers, and non-drinking drivers. All categories of non-drinking driver collisions showed increases over 1983 with the exception of "Disabling Injury," which showed a drop of 4.2%. In contrast drivers under the influence showed slight decreases in "Disabling Injury," "Property Damage Accidents," and "Total Reported Accidents."

Table 2-6 displays the number of persons killed and injured by drivers "under the influence" and "who had been drinking" by months for 1982, 1983, and 1984. The summer months typically show a higher incidence of persons killed or injured for both categories of alcohol-involved drivers.

Table 2-5 **Summary of Persons Killed and Injured In Alcohol Related Collisions**
1982 - 1983 - 1984

	Drivers Under the Influence				All Drivers Who Had Been Drinking (HBD) (including DUI)				Non-Drinking Driver Collisions		
	1982	1983	1984	% of Change 84-83	1982	1983	1984	% of Change 84-83	1983	1984	% of Change 84-83
Persons Killed	366	299	331	+10.7%	442	364	386	+6.0%	341	375	+10.0%
Persons Injured	8,202	7,446	7,517	*	14,491	12,909	13,118	+1.6%	45,408	48,248	+ 6.2%
Disabling Injury	1,795	1,667	1,666	*	3,018	2,634	2,733	+3.8%	5,766	5,521	- 4.2%
Non-Disabling Injury	4,017	3,616	3,674	+ 1.6%	7,035	6,260	6,332	+1.1%	17,678	18,501	+ 4.7%
Possible Injury	2,390	2,163	2,177	*	4,438	4,015	4,053	*	21,964	24,226	+10.3%
Property Damage Accidents	4,713	4,114	4,019	- 2.3%	8,905	7,855	7,809	*	57,834	61,083	+ 5.6%
Total Investigated Accidents	10,292	9,207	9,101	- 1.2%	18,669	16,570	16,609	*	90,027	95,046	+ 5.6%

*Less than 1/10th of one percent.

Table 2-6 **Persons Killed and Injured In Alcohol Related Collisions By Month**
1982 - 1983 - 1984

	From Drivers "Under the Influence"						From Drivers Who "Had Been Drinking"					
	Persons Killed			Persons Injured			Persons Killed			Persons Injured		
Month	1982	1983	1984	1982	1983	1984	1982	1983	1984	1982	1983	1984
January	23	23	16	586	527	486	28	29	20	1,101	893	795
February	21	12	22	625	568	494	23	14	23	1,090	910	822
March	24	24	23	677	631	671	29	27	30	1,118	1,031	1,112
April	34	27	25	714	670	621	37	38	32	1,215	1,207	1,108
May	38	23	28	745	689	624	44	24	33	1,352	1,236	1,133
June	32	29	36	664	665	621	44	33	42	1,202	1,183	1,132
July	43	29	40	804	719	700	51	37	48	1,516	1,239	1,254
August	41	35	36	721	622	739	46	40	40	1,312	1,039	1,267
September	44	33	32	734	599	716	59	37	35	1,252	973	1,257
October	36	22	28	729	647	694	41	29	33	1,231	1,139	1,139
November	18	24	27	518	613	546	26	33	32	1,004	1,162	1,015
December	12	18	18	685	496	605	14	23	18	1,098	897	1,094
TOTALS	366	299	331	8,202	7,446	7,517	442	364	386	14,491	12,909	13,118

YOUTH INVOLVEMENT

Overview

Drivers 20 years old and under comprised 8% of all licensed drivers in the state in 1984, yet this age group was involved in 19.5% of the total 1984 collisions. This was an accident over-representation rate 2.4 times higher than the percentage of licensed drivers comprising this group. The 21-24 age group was involved in 14.5% of the total collisions while comprising 9.3% of all licensed drivers, producing an over-representation factor of 1.6. The 25-29 year old group, comprising 13% of all licensed drivers, was involved in 14.7% for an over-representation of 1.13. All other age groups were under-represented when their percentages of accident involvement were compared to their percentages of total licensed drivers (Table 3-1).

DRIVER AGE DISTRIBUTION — 1984

Table 3-1 COMPARISON OF DRIVERS INVOLVED TO NUMBER LICENSED

Age of Driver	Involved in Collisions Number	Involved in Collisions % of Total	Percent of Licensed Drivers	Over/Under Representation Ratio
Under 16	683	0.40	—	—
16	5,081	2.97	0.92%	3.23
17-18	13,509	7.90	3.09%	2.56
19-20	13,989	8.19	3.94%	2.08
21-22	13,047	7.63	4.45%	1.71
23-24	11,735	6.86	4.83%	1.42
25-29	25,075	14.67	13.00%	1.13
30-34	20,697	12.11	13.08%	.93
35-39	16,782	9.82	11.77%	.83
40-44	11,522	6.74	8.98%	.75
45-49	8,258	4.87	6.81%	.71
50-54	6,919	4.05	6.02%	.67
55-59	6,529	3.82	5.88%	.65
60-64	5,587	3.27	5.80%	.56
65-69	4,443	2.60	4.68%	.56
70 and over	7,071	4.14	6.75%	.61

YOUTHFUL DRIVER INVOLVEMENT IN COLLISIONS BY FIRST HARMFUL EVENT

In 1984, 72.6% of those drivers aged 24 years and younger who were involved in all collisions collided with other moving vehicles. This type of collision also resulted in the greatest percentage of fatal collisions (39.3%) and injury collisions (68.3%). Single vehicle collisions with fixed objects led to the second largest percentage of youthful driver involvement in total, fatal and injury collisions, at 16.3%, 27.5% and 18.1% respectively (Table 3-2).

Table 3-2 YOUTHFUL DRIVERS BY FIRST EVENT — 1984

	In Total Collisions	Percent of Total	In Fatal Collisions	Percent of Total	In Injury Collisions	Percent of Total
Collision with other moving motor vehicles	36,540	72.6%	120	39.3%	13,953	68.3%
Collision with parked vehicle	2,017	4.0%	5	1.6%	514	2.5%
Collision with fixed/ other object	8,191	16.3%	84	27.5%	3,690	18.1%
Overturning and other non collision	2,547	5.0%	53	17.4%	1,526	7.5%
Other Collisions, including Ped., Pedal., Animal, R.R. Train	1,002	2.0%	43	14.1%	737	3.6%
TOTAL	50,297	100.0%	305	100.0%	20,420	100.0%

YOUTHFUL COLLISION INVOLVEMENT BY AGE GROUP

In 1984 the 16-20 year old age group was involved in 19.1% of all collisions. This group's over-representation ratio of 2.39 was up from the 2.30 ratio for 1983. It is also the highest over-representation ratio for any age group (Figure 3-1). The 21-24 year old age group increased its over-representation ratio from 1.5 to 1.6 (Figure 3-2). The 25-29 age group posted an over-representation ratio of 1.13, up slightly from the previous year's 1.12 (Figure 3-3). The 30 year and older age group continued to be under-represented in total collisions compared to this group's percentage of all licensed drivers (Figure 3-4).

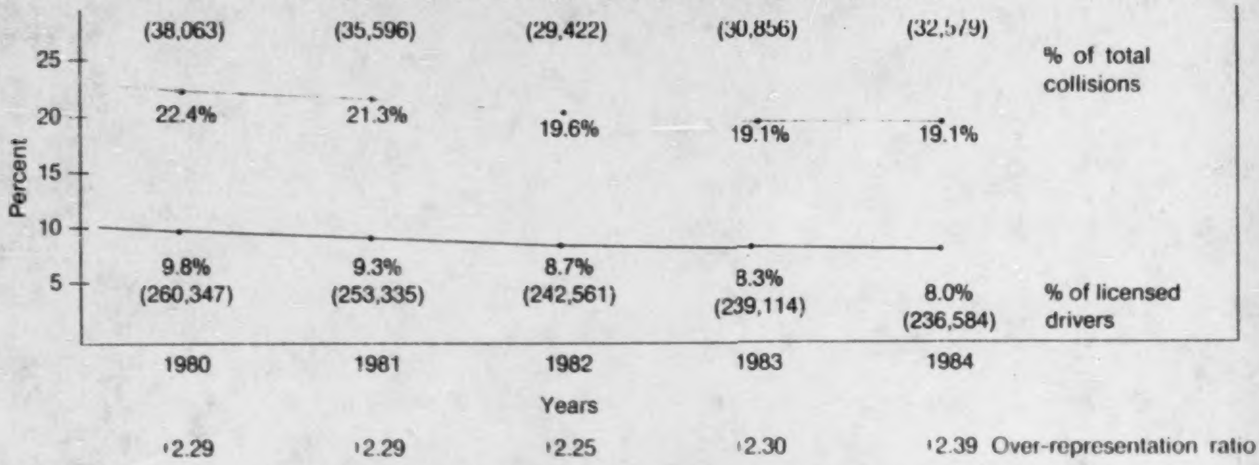


Figure 3-1 16-20 Year Old % Of Involvement In Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

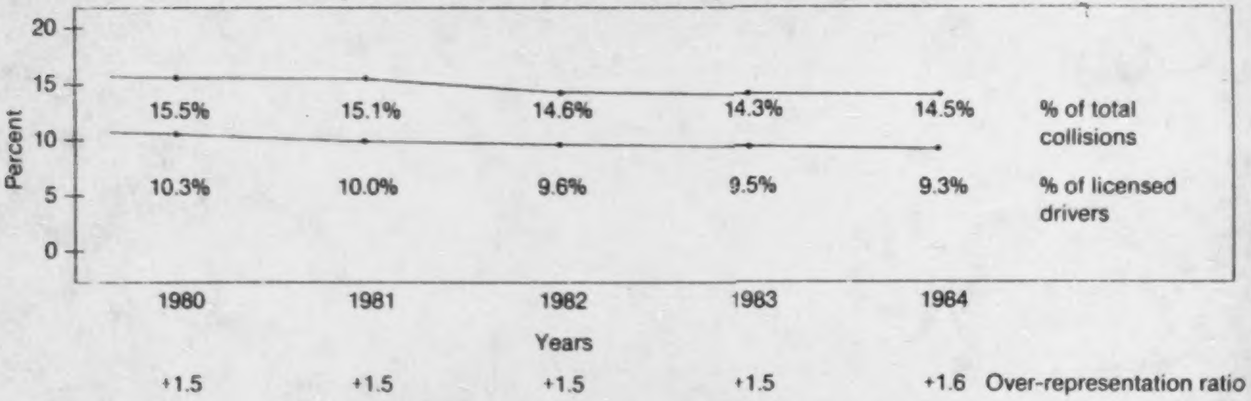


Figure 3-2 21-24 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

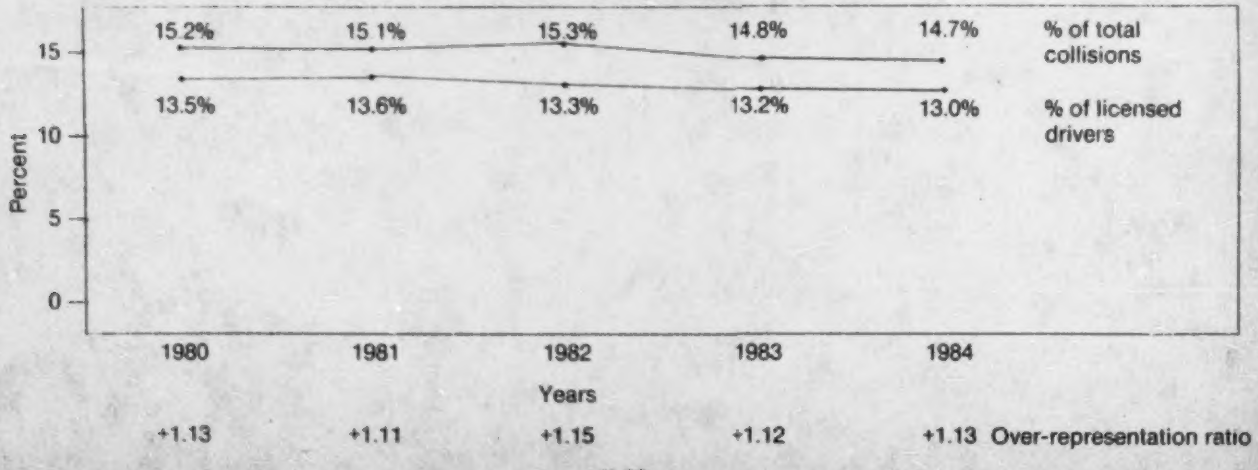
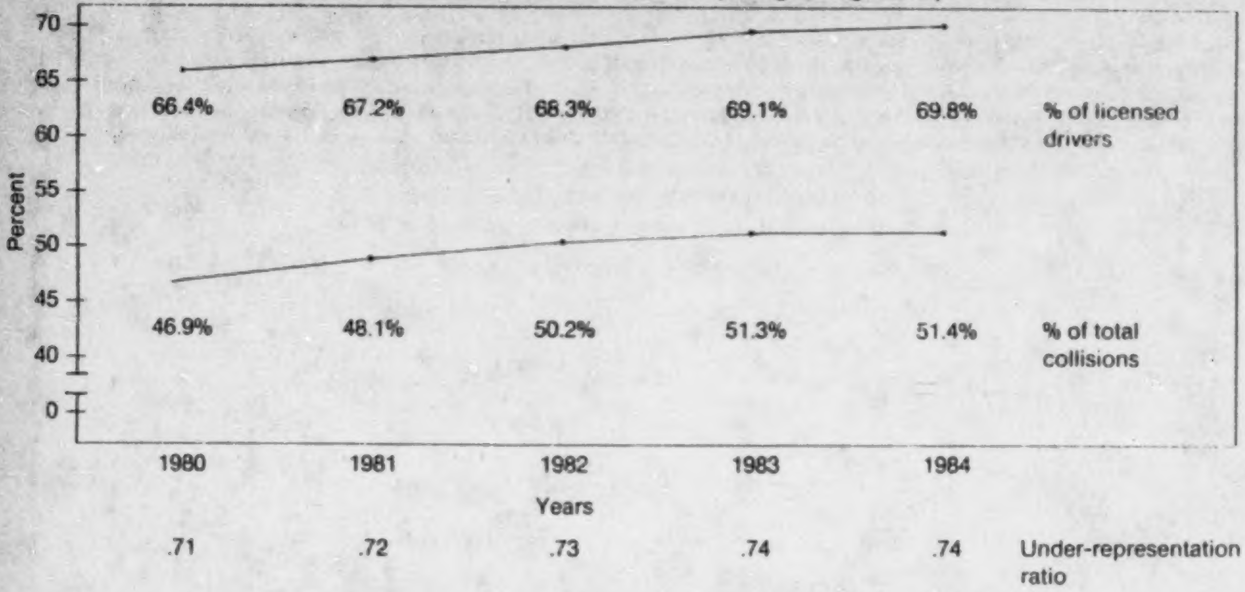


Figure 3-3 25-29 Year Old % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group

Figure 3-4

30 Years Old and Older % of Involvement in Total Collisions Compared to % of Licensed Drivers Comprising the Age Group



COLLISION SEVERITY BY AREA FOR YOUTHFUL DRIVERS

In 1984, urban collisions involving youthful drivers (24 years old and younger) increased slightly to 57.9% while rural collisions involving youthful drivers made up 42.1% of the total (Figure 3-5). In 1984, youthful driver injury collisions increased in urban areas over 1983 but declined in rural areas during the same time frame (Figure 3-6). Youthful driver fatal collisions continued to be far more common in rural areas. In 1984, 76.1% of the fatal collisions involving youthful drivers occurred in rural areas (Figure 3-7).

Figure 3-5

Youthful Drivers Involved In Total Collisions

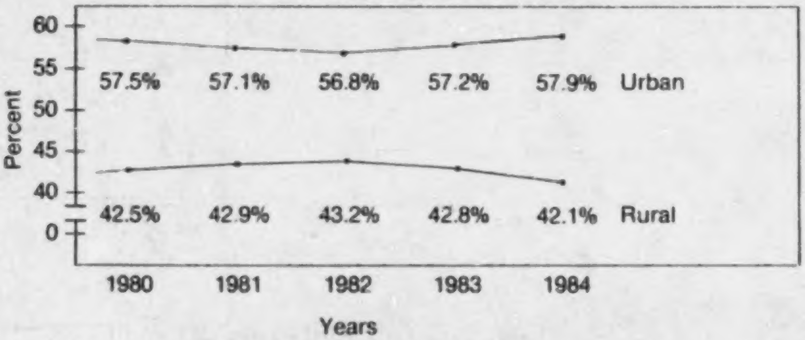


Figure 3-6

Youthful Drivers Involved In Injury Collisions

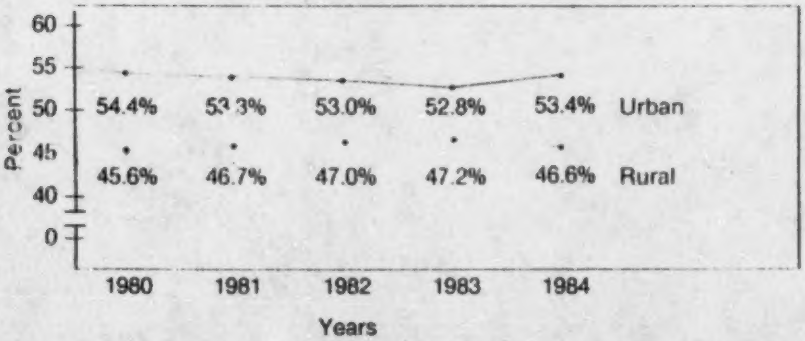
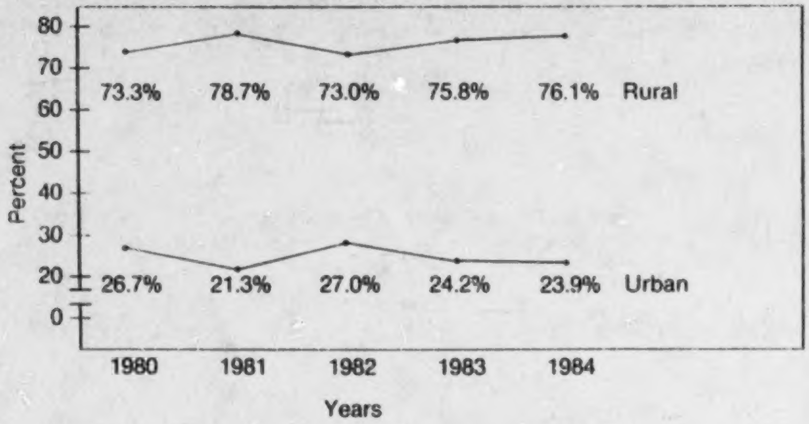


Figure 3-7 Youthful Drivers Involved In Fatal Collisions



YOUTHFUL DRIVER INVOLVEMENT BY TIME

In 1984, 20.3% of all the rural fatal collisions and 18.3% of all rural reported collisions involving youthful drivers occurred on Saturday (Figure 3-8). In urban areas, Friday had the highest occurrence of fatal collisions involving youthful drivers (19.2%). Friday also recorded the greatest percentage of total collisions (19.1%) for the group (Figure 3-9).

Figure 3-8 Youthful Drivers Involved In Rural Area Fatal and Total Collisions — 1984 — By Day Of Week

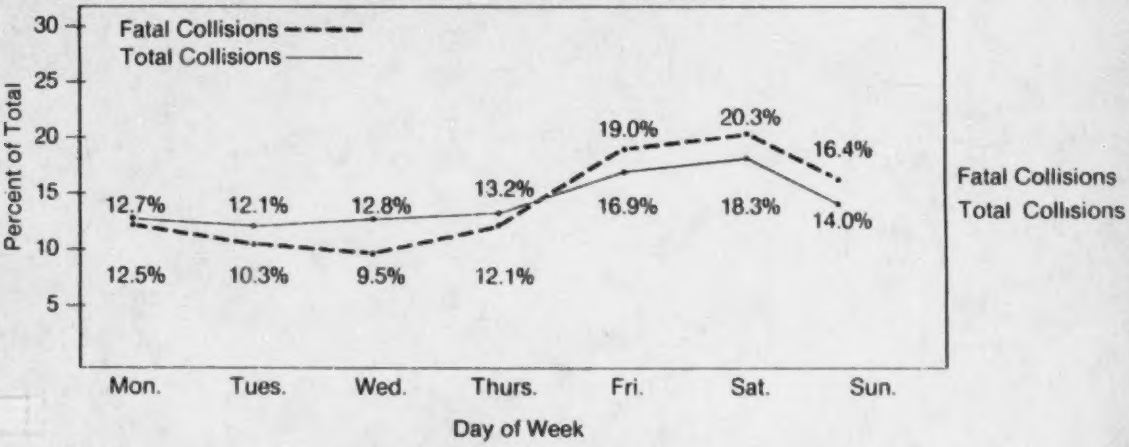
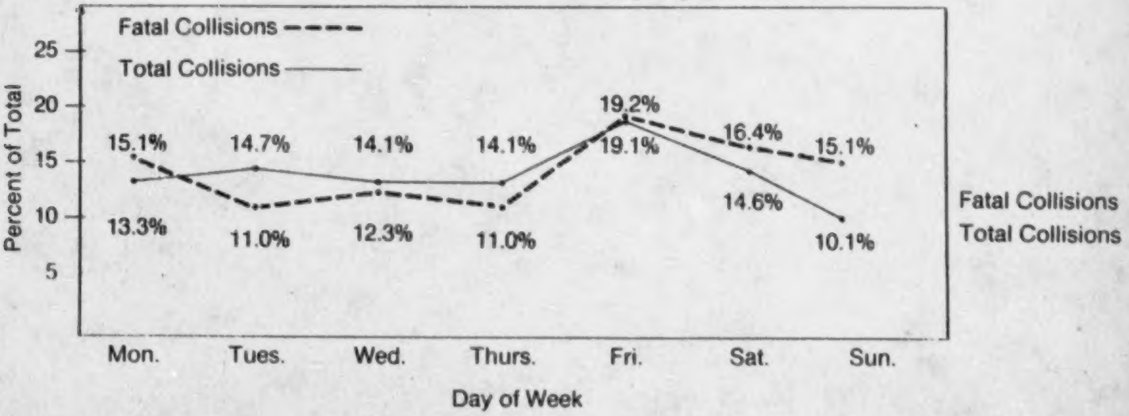


Figure 3-9 Youthful Drivers Involved In Urban Area Fatal and Total Collisions — 1984 — By Day Of Week



In rural areas, the greatest percentage (18.5%) of youthful driver involvement in fatal crashes in 1984 occurred from 6 PM to 9 PM. The greatest percentage of total collision involvement (22.6%) for these drivers was from 3 PM to 6 PM (Figure 3-10). In the urban areas, the greatest youthful involvement by time period in fatal collisions was 24.7% in the midnight to 3 AM period. The 3 PM to 6 PM time period recorded 26.3% of the youthful drivers involved in total urban collisions (Figure 3-11).

Figure 3-10

Youthful Drivers Involved In Rural Area
Fatal and Total Collisions — 1984 — By Hour Of Day

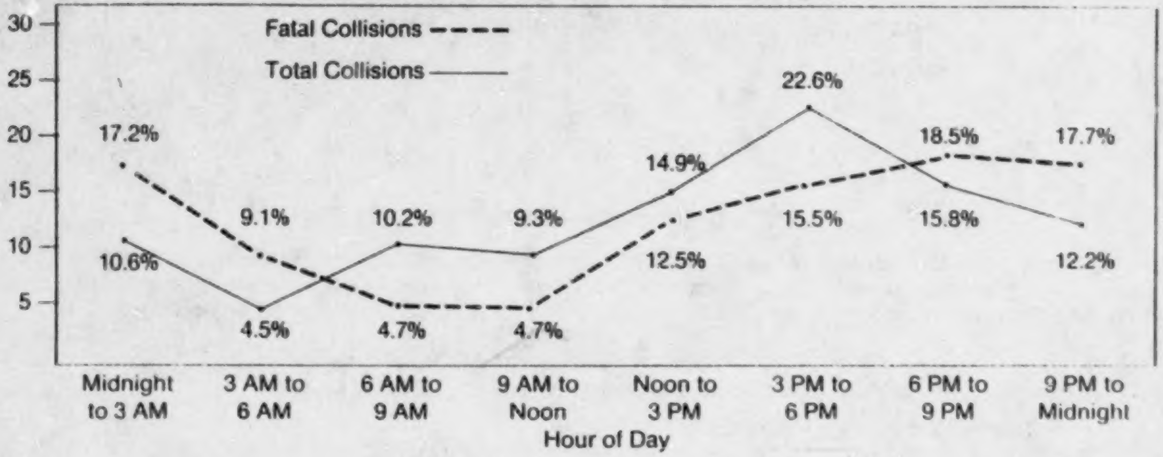
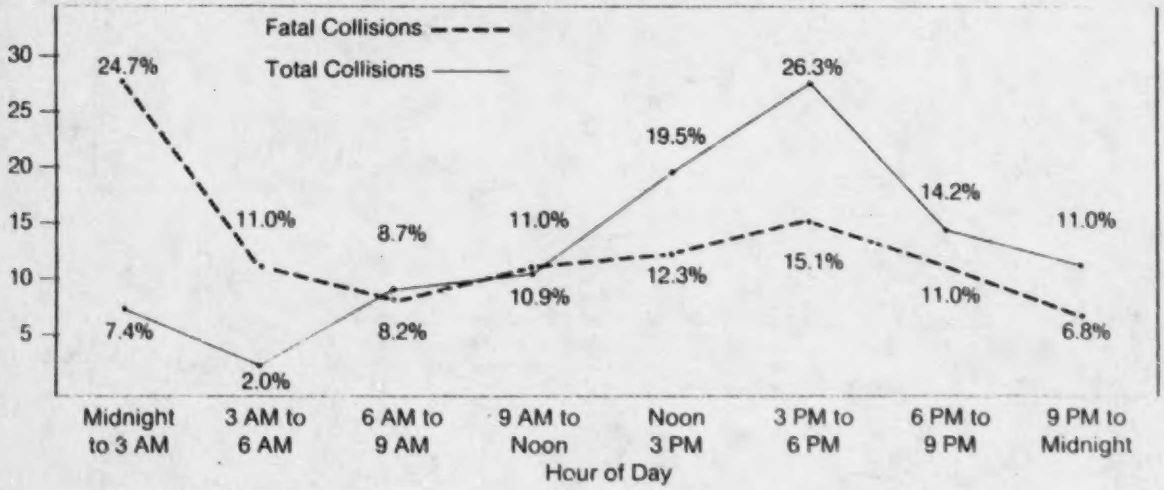


Figure 3-11

Youthful Drivers Involved In Urban Area
Fatal and Total Collisions — 1984 — By Hour Of Day



SAFETY RESTRAINT USAGE

Overview

In 1984, out of a total of 161,513 occupants involved in total collisions, 45,214 were using safety restraints. This is a usage rate of 27.9% and marks the third consecutive year of increases in safety restraint usage since 1981 (Table 4-1).

Table 4-1 **USAGE RATE**

	1984	%	1983	%	1982	%	1981	%	1980	%
Restraints Used	45,214	27.9%	31,751	21.0%	24,763	17.8%	25,190	15.9%	27,018	17.4%
No Restraints Used	116,299	72.0%	119,670	79.0%	114,686	82.2%	132,921	84.1%	128,264	82.6%
Total	161,513	100.0%	151,421	100.0%	139,449	100.0%	158,111	100.0%	155,282	100.0%

In 1984, 45,196 persons out of a total of 161,470 accident-involved occupants were using a restraining device. Child restraints were used by 1,915 collision-involved children (Table 4-2). Looking at all restraining devices by usage and non-usage categories, it appears that with the safety restraint usage, injuries were less likely to occur and those that did occur were less severe (Appendix C).

Table 4-2 **RESTRAINT USAGE AND INJURIES SUSTAINED***

	Restraints Used		Child Restraints**		No Restraints		Total Occupants	
	Number	%	Number	%	Number	%	Number	%
Deaths	50	0.11%	1	0.05%	478	0.41%	528	0.33%
Disabling Injuries	716	1.6%	9	0.5%	4,523	3.9%	5,239	3.2%
Evident Injuries	3,312	7.3%	113	5.9%	13,932	12.0%	17,255	10.7%
Possible Injuries	5,637	12.5%	141	7.4%	13,970	12.0%	19,607	12.1%
No Injuries	35,481	78.5%	1,651	86.2%	83,361	71.7%	118,841	73.7%
Totals	45,196	100.0%	1,915	100.0%	116,264	100.0%	161,470	100.0%

*Excludes cases where injury severity was not stated.
**Included with Restraints Used category

In 1984, 31.4% of the female drivers used their restraints while 27.3% of the male drivers used their restraints in collisions. Female passengers had a usage rate of 28.4% compared to 26.4% for male passengers. The 0-5 age group had the highest restraint usage of any age group at 47.3%. The age group with the lowest usage rate was the 16-19 year olds at 19.6% usage (Table 4-3).

Table 4-3 **USAGE RATES BY SEX AND AGE GROUP — 1980 - 1984**

	Percent Used Restraints				
Occupant	1984	1983	1982	1981	1980
Male Driver	27.3	22.0	19.1	17.4	19.3
Female Driver	31.4	23.6	20.0	18.2	19.9
Male Passenger	26.4	14.8	11.2	9.9	10.6
Female Passenger	28.4	18.9	15.3	12.6	13.5
Age 0-5	66.8	42.3	32.2	26.1	24.0
Age 6-15	24.9	14.8	11.5	9.6	9.7
Age 16-19	19.6	14.0	11.5	11.7	12.0
Age 20-24	22.0	16.3	14.3	13.4	14.8
Age 25-34	29.5	23.0	19.6	17.5	19.4
Age 35-64	32.0	23.3	22.2	20.3	22.3
Age 65 & Up	27.6	21.4	18.3	19.5	18.0

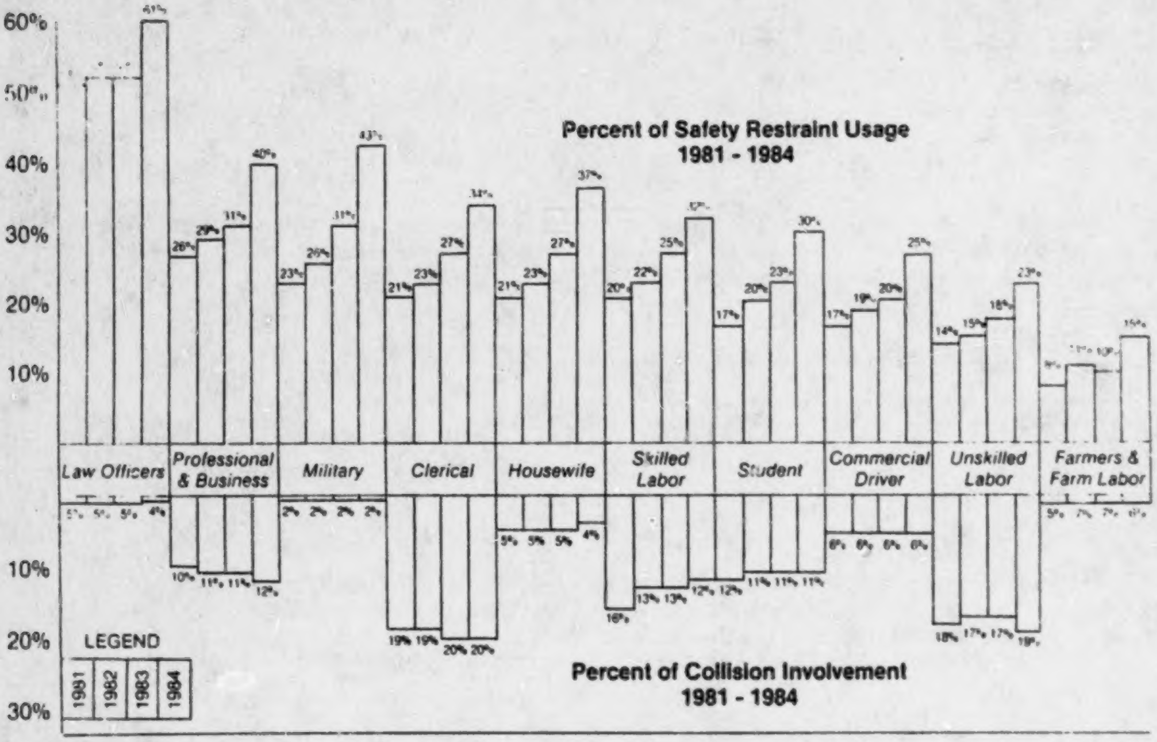
Examination of restraint usage by occupant age for 1984 reveals that the 0-1 age group had the highest usage rate at 79.1%. The lowest rate of restraint usage (14.7%) was for 14-year-old occupants (Table 4-4).

Table 4-4 **1984 SEAT BELT USAGE BY OCCUPANT AGE**

Age	Lap Belt	Shoulder Belt	Lap & Shoulder Belt	Child Retraint	Air Bag Activated	Total Restraints Used Number	Total Restraints Used % of Total	Restraints Not Used Number	Restraints Not Used % of Total
0 - 1	75	4	61	589	0	729	79.1%	193	20.9%
2	191	9	91	407	0	698	69.7%	303	30.3%
3	269	5	87	236	0	597	64.1%	334	35.9%
4	288	14	120	131	0	553	59.1%	383	40.9%
5	258	6	90	57	0	411	51.7%	384	48.3%
6	190	4	101	20	0	315	44.1%	400	55.9%
7	152	12	67	7	0	238	36.8%	408	63.2%
8	114	4	69	4	0	191	31.9%	407	68.1%
9	93	3	65	3	0	164	30.5%	373	69.5%
10	69	4	62	0	0	135	24.5%	417	75.5%
11	91	6	45	0	0	142	26.0%	404	74.0%
12	95	9	69	0	0	173	25.7%	500	74.3%
13	72	5	83	0	0	160	19.4%	663	80.6%
14	78	9	82	0	0	169	14.7%	977	85.3%
15	156	16	181	0	0	353	17.2%	1,694	82.8%
16	493	66	750	0	1	1,310	21.9%	4,675	78.1%
17	541	74	646	0	0	1,261	19.0%	5,390	81.0%
18	574	60	702	0	2	1,338	18.7%	5,824	81.3%
19	490	62	707	0	0	1,259	18.9%	5,420	81.1%
20	508	62	687	0	0	1,257	19.3%	5,266	80.7%
21 - 24	1,775	252	2,945	0	1	4,973	22.6%	17,040	77.4%
25 - 29	1,783	310	3,679	0	2	5,774	28.2%	14,735	71.8%
30 - 64	5,898	1,041	11,622	0	10	18,571	31.7%	40,088	68.3%
65 & Over	1,093	160	1,583	0	2	2,838	29.2%	6,867	70.8%
Age Unknown	228	28	325	440	1	1,022	30.6%	2,317	69.4%
TOTAL	15,574	2,225	24,919	1,894	19	44,631	27.9%	115,462	72.1%

The usage rate of safety restraints by occupation of driver ranges from a high of 61% for law officers to a low of 15% for farmers and/or farm labor. Usage rates for all occupations showed increases in 1984 over the rates for the preceding three years (Figure 4-1).

Figure 4-1 **Collision Involvement and Safety Restraint Usage By Driver Occupation 1981 - 1984**



Freeway travel (interstates and other controlled access routes) had the highest usage rate by vehicle occupants at 41% Occupants of vehicles traveling on county roads had the lowest recorded usage rate at 24.3% (Table 4-5).

Table 4-5 **RESTRAINT USAGE BY FUNCTIONAL CLASS OF ROADWAY BY YEAR**

Functional Class	1984	1983	1982	1981	1980
Interstate and limited access	41.0%	27.4%	29.0%	25.3%	29.4%
Other state routes	28.9%	21.1%	17.8%	16.2%	21.4%
County roads	24.3%	17.7%	15.0%	13.7%	18.7%
City streets	26.4%	20.1%	16.3%	14.9%	21.4%
All others	24.8%	19.8%	16.6%	16.6%	21.3%

Examination of safety restraint usage by vehicle type reveals substantial increases in usage rates for all types of vehicle The lowest usage rate (20.1%) in 1984 was recorded for those in heavy trucks (Table 4-6).

Table 4-6 **SEAT BELT USAGE RATE BY TYPE OF VEHICLE DRIVERS 1980 - 1984**

Type of Vehicle	1984	1983	1982	1981	1980
Passenger car	29.8%	22.4%	19.0%	17.2%	22.8%
Light trucks (under 10,000 gross)	22.2%	16.2%	13.0%	11.2%	16.1%
Heavy trucks (10,000 gross & over)	20.1%	16.0%	15.2%	13.9%	18.4%
All others	30.9%	21.5%	22.1%	15.0%	23.0%

In 1984, 68.3% of the occupants were using safety restraints in all state registered vehicles involved in collisions. This is up 8.3% from the preceding year. The next highest usage rate was the 58.6% reported for "Other government (federal agency) registered vehicles." The lowest usage rate for 1984 was the 41.4% reported for municipal registered vehicles (Table 4-7).

Table 4-7 **SEAT BELT USAGE RATE BY TYPE OF GOVERNMENT VEHICLES**
1980 - 1984

Type of Government Vehicle	1984	1983	1982	1981	1980
State registered vehicles	68.3%	60.0%	65.0%	65.0%	46.0%
County registered vehicles	43.6%	32.3%	37.3%	30.1%	39.7%
Municipal registered vehicles	41.4%	35.1%	28.1%	27.7%	30.9%
Other government registered vehicles	58.6%	54.2%	44.4%	39.2%	50.0%

Drivers residing within 15 miles of their accident scenes recorded the lowest seat belt usage rate in 1984. Just 28.2% in this category were using restraints. Out-of-state drivers continued to use restraints at the highest rate, 35.1%. All categories continued to record increases in restraint usage rates over previous years (Table 4-8).

Table 4-8 **SEAT BELT USAGE RATE BY PROXIMITY OF DRIVER RESIDENCE**
1980 - 1984

Residence Proximity	1984	1983	1982	1981	1980
Resided within 15 miles of collision	28.2%	22.1%	18.9%	17.3%	23.7%
Resided over 15 miles	31.1%	23.7%	21.2%	19.3%	24.3%
Residing in other state	35.1%	28.6%	24.4%	22.4%	29.3%

An examination of restraint usage by seat position in 1984 reveals that occupants in the left back and right back positions were the most frequent restraint users at 36.5% and 34.6%, respectively. These positions include the greatest usage of child restraints. Drivers were the next most frequent users at 28.6%. Seat position occupants showing the least usage of restraints were those riding in the mid-front, where 17.1% were reported using restraints (Table 4-9).

Table 4-9 **RESTRAINT USAGE BY OCCUPANT SEAT POSITION**

Occupants	1984	1983	1982	1981	1980
Driver	28.6%	22.5%	19.3%	17.7%	24.0%
Mid-front	17.1%	10.6%	7.6%	7.2%	9.6%
Right-front	24.6%	17.0%	14.3%	12.4%	17.0%
Left-back	36.5%	22.2%	16.4%	12.6%	14.3%
Mid-back	25.7%	14.9%	11.0%	7.7%	10.8%
Right-back	34.6%	21.9%	16.2%	12.4%	14.4%
Other	13.0%	4.8%	3.8%	2.7%	2.6%
TOTAL	27.9%	21.0%	17.8%	16.0%	21.5%

Table 4-10 presents 1984 restraint usage by occupant age and seat position. The left-back and right-back for the 0-4 age group had the highest reported usage at 79.8% and 78.8%, respectively. For the 5-9 age group, the most frequent safety restraint usage also occurred in the left-back (48.8%) and right-back (47.0%) seat positions. The positions with the lowest reported usage rates for the 15-20 age group were the mid-front and mid-back seats—4.8% and 5.9%. This also held true for the 21-24 age group. The driver continued to "buckle up" more than any other occupant for those aged 15 through 64. The mid-front occupant was the most frequent restraint user at 37.7% in the 65 and over age category.

Table 4-10 **RESTRAINT USAGE BY OCCUPANT AGE AND SEAT POSITION**

1984

Seat Position	0 - 4	5 - 9	10-14	15-20	21-24	25-29	30-64	65 & Over
Driver	—	—	—	22.1%	24.9%	30.2%	32.6%	28.9%
Mid-front	52.0%	31.0%	11.5%	4.8%	6.4%	7.7%	9.7%	37.7%
Right-front	64.6%	41.0%	22.6%	14.4%	17.1%	23.0%	28.8%	31.5%
Left-back	79.8%	48.8%	27.0%	13.7%	9.3%	16.8%	20.2%	29.1%
Mid-back	38.5%	35.5%	9.9%	5.9%	6.4%	9.8%	10.1%	20.0%
Right-back	78.8%	47.0%	25.7%	15.1%	12.6%	16.6%	21.5%	25.2%
Other	32.1%	15.9%	2.3%	6.1%	8.1%	5.0%	6.9%	0
Seat Location Unknown	50.0%	23.6%	10.1%	7.8%	7.5%	9.3%	12.7%	22.2%

A more detailed breakdown of types of restraints used by injury severity is presented for 1984 in Table 4-11. Of 528 occupants killed in vehicle crashes, 478 (90.6%) were not using restraints. Of the 5,203 persons sustaining disabling injuries by collisions, 86.4% were using no restraints.

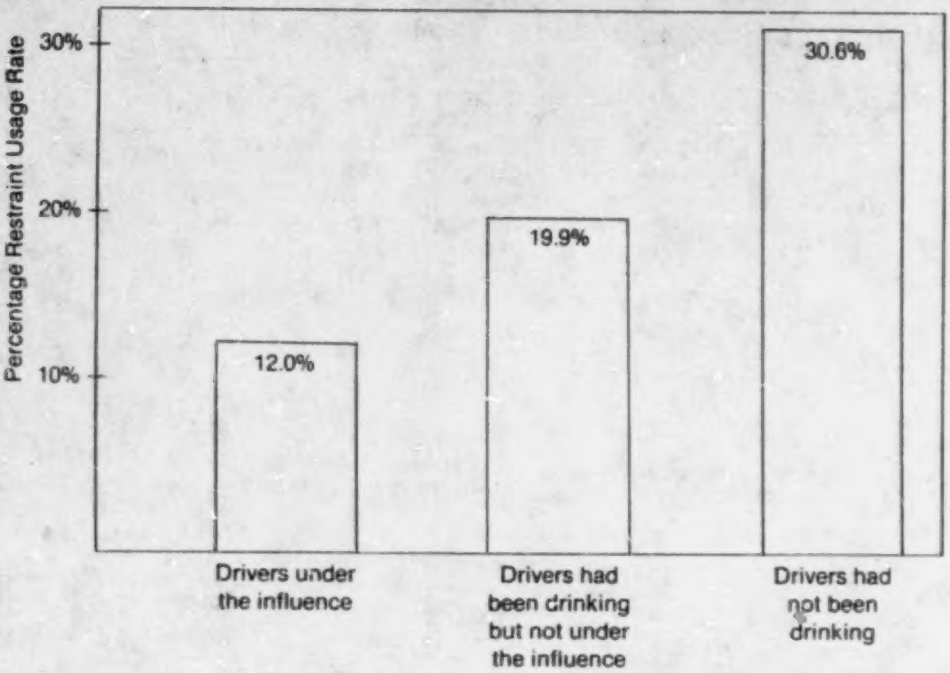
Table 4-11 **TYPES OF RESTRAINTS USED BY SEVERITY OF INJURY — 1984**

	Number Used		Deaths		Disabling Inj.		Evident Injury		Possible Injury		No Injury	
Type	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Lap Belt	15,569	9.7	16	3.0	253	4.9	1,203	7.0	1,682	8.7	12,415	10.5
Shoulder Belt	2,222	1.4	2	0.4	23	0.4	176	1.0	293	1.5	1,728	1.5
Lap & Shoulder Belt	24,910	15.6	31	5.8	422	8.1	1,797	10.5	3,439	17.7	19,221	16.3
Child Restraint	1,893	1.2	1	0.2	9	0.2	110	0.6	141	0.7	1,632	1.4
Air Bag (Activated)	19	*	0	0.0	1	*	0	0.0	3	*	15	*
No Restraints	115,425	72.1	478	90.6	4,495	86.4	13,837	80.9	13,858	71.4	82,757	70.3
Total Occupants	160,038	100.0	528	100.0	5,203	100.0	17,123	100.0	19,416	100.0	117,768	100.0

*Less Than 1/10 of 1 percent.

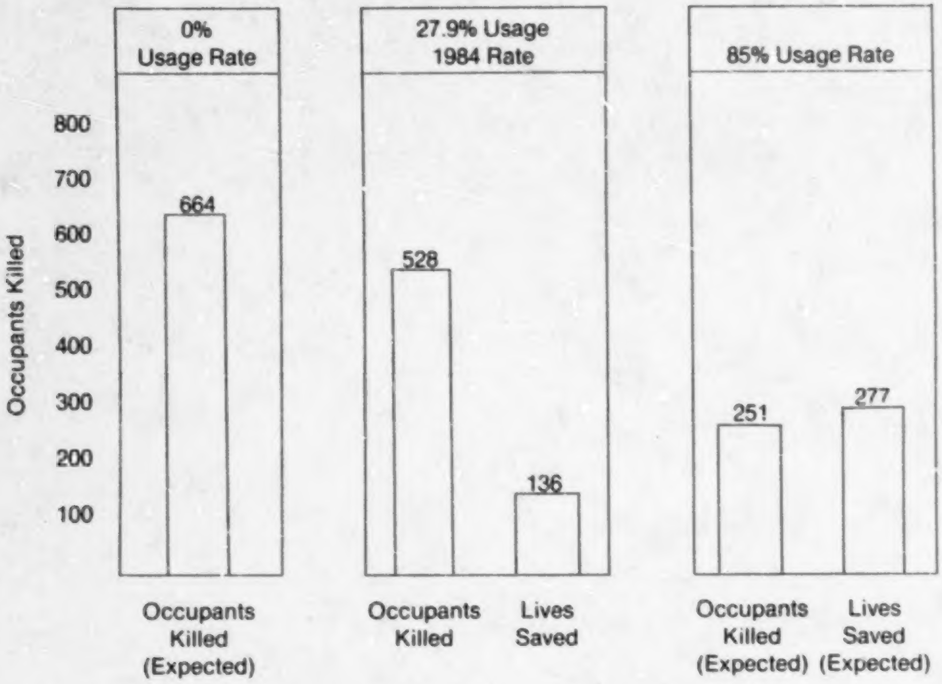
Of all collision-involved drivers in 1984, those who had been drinking displayed a greater tendency not to use restraints than those drivers who had not been drinking. The latter category revealed a restraint-usage rate of 30.6% compared to a usage rate of 12% for drivers under the influence and 19.9% for drivers who had been drinking but were not under the influence (Figure 4-2).

Figure 4-2 **Restraint Usage By Sobriety**



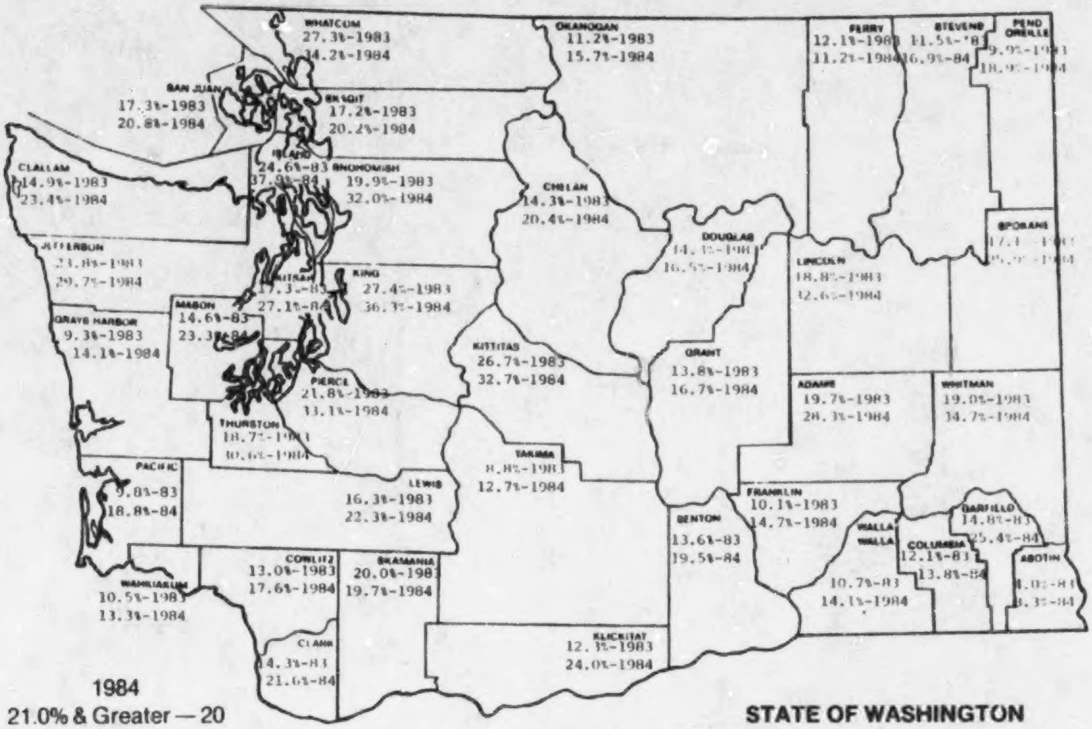
From the data obtained for restraint usage and number of fatalities in 1984, it is possible to project the number of fatalities that would have occurred under varying restraint usage rates (Figure 4-3). As shown in the middle block, occupant restraint devices were used by 27.9% of the occupants involved in collisions. At this usage rate, there were 528 fatalities. Based on this information, it is estimated that 136 lives were saved by restraint usage. The block to the left presents the situation that could have been expected to exist if no restraints were used. Assuming that the usage rate among vehicle occupants could be brought up to the 85% level, it is projected that there would have been 251 fatalities and 277 lives would have been saved. From these computations, it appears that the higher the usage rate, the greater the savings in lives. (See Appendix C for computation).

Figure 4-3 **Occupant Restraints Usage in Fatal Crashes**



A graphic depiction of restraint use by county is presented in Figure 4-4. Island County at 37.9% had the highest usage rate of all counties in the state in 1984. King County had the next highest usage rate at 36.3%. The county with the lowest usage rate was Asotin County at 8.3%.

Figure 4-4 **Seat Restraint Usage Rate By County — 1983/84**


WHATCOM
27.3%-1983
34.2%-1984
OKANOGAN
11.2%-1983
15.7%-1984
FERRY
12.1%-1983
11.2%-1984
STEVENS
11.5%-'83
16.9%-84
PEND OREILLE
9.9%-1983
18.9%-1984
SAN JUAN
17.3%-1983
20.8%-1984
SKAGIT
17.2%-1983
20.2%-1984
CLALLAM
14.9%-1983
23.4%-1984
ISLAND
24.6%-83
37.9%-84
SNOHOMISH
19.9%-1983
32.0%-1984
CHELAN
14.3%-1983
20.4%-1984
DOUGLAS
14.1%-1983
16.5%-1984
SPOKANE
17.1%-1983
25.9%-1984
JEFFERSON
23.8%-1983
29.7%-1984
LINCOLN
18.8%-1983
32.6%-1984
KITSAP
17.3%-83
27.1%-84
KING
27.4%-1983
36.3%-1984
MASON
14.6%-83
23.3%-84
GRAYS HARBOR
9.3%-1983
14.1%-1984
KITTITAS
26.7%-1983
32.7%-1984
GRANT
13.8%-1983
16.7%-1984
PIERCE
21.8%-1983
33.1%-1984
ADAMS
19.7%-1983
28.3%-1984
WHITMAN
19.0%-1983
34.7%-1984
THURSTON
18.7%-1983
30.6%-1984
YAKIMA
8.8%-1983
12.7%-1984
PACIFIC
9.8%-83
18.8%-84
LEWIS
16.3%-1983
22.3%-1984
FRANKLIN
10.1%-1983
14.7%-1984
GARFIELD
14.8%-83
25.4%-84
BENTON
13.6%-83
19.5%-84
WALLA WALLA
10.7%-83
14.1%-1984
COLUMBIA
12.1%-83
13.8%-84
ASOTIN
1.0%-83
8.3%-84
COWLITZ
13.0%-1983
17.6%-1984
SKAMANIA
20.0%-1983
19.7%-1984
WAHKIAKUM
10.5%-1983
13.3%-1984
KLICKITAT
12.3%-1983
24.0%-1984
CLARK
14.3%-83
21.6%-84

1984
21.0% & Greater — 20
15.0% — 20.9% — 12
14.9% & Under — 7

STATE OF WASHINGTON
STATEWIDE USAGE RATE 21.0%-1983
29.7%-1984

MOTORCYCLE COLLISIONS

Overview

In 1984 motorcycle fatal, injury and total collisions decreased 31%, 3.3%, and 3% respectively, when compared to the previous 4-year baseline average. Registration in 1984 totaled 126,703 motorcycles, a decrease of 5.3% over the baseline period. The motorcycle collision rate of 2.74 for 1984 was up 2.2% over the baseline rate of 2.68 motorcycle collisions per every 100 registered (Table 5-1).

Table 5-1 **MOTORCYCLE COLLISIONS 1980 — 1984**

	1980	1981	1982	1983	Previous 4 Year Average	1984	Change 84-4 Yr. Average
Total Collisions	3,914	3,728	3,376	3,312	3,583	3,477	- 3.0%
Fatal Collisions	116	104	103	77	100	69	-31.0%
Fatal Collisions Ratio (Fatal Collisions per 1,000 motorcycle coll.)	29.6	27.9	30.9	23.2	27.9	19.8	-29.0%
Fatal Registration Rate (Fatal Collisions per 1,000 motorcycles reg.)	.854	.743	.782	.570	.747	.545	-27.0%
Injury Collisions	3,373	3,186	2,867	2,839	3,066	2,965	- 3.3%
Motorcycle Registration	135,899	139,931	131,667	127,950	133,862	126,703	- 5.3%
Total Collision Registration Rate (Motorcycle involved per 100 registered)	2.88	2.66	2.56	2.59	2.68	2.74	+ 2.2%

MOTORCYCLE COLLISIONS BY LOCATION

Table 5-2 displays a breakdown of motorcycle collision data by totals for urban and rural areas as well as the state as a whole for 1984 and 1983. In 1984 rural areas again led urban areas in the total number of fatal collisions, 45 to 24, while urban areas led rural areas in total number of injury collisions, 1,594 to 1,371.

Table 5-2 **MOTORCYCLE COLLISION DATA**

	1984			1983		
	Urban	Rural	Statewide	Urban	Rural	Statewide
Total Collisions	1,920	1,557	3,477	1,752	1,560	3,312
Fatal Collisions	24	45	69	30	47	77
Total Fatalities	25	50	75	30	47	77
Injury Collisions	1,594	1,371	2,965	1,475	1,364	2,839
Property Damage Only, Collisions	302	141	443	247	149	396
All Persons Injured	1,935	1,721	3,656	1,815	1,740	3,555
Motorcyclists Killed	23	49	72	30	47	77
Motorcyclists Injured	1,806	1,628	3,434	1,704	1,647	3,351

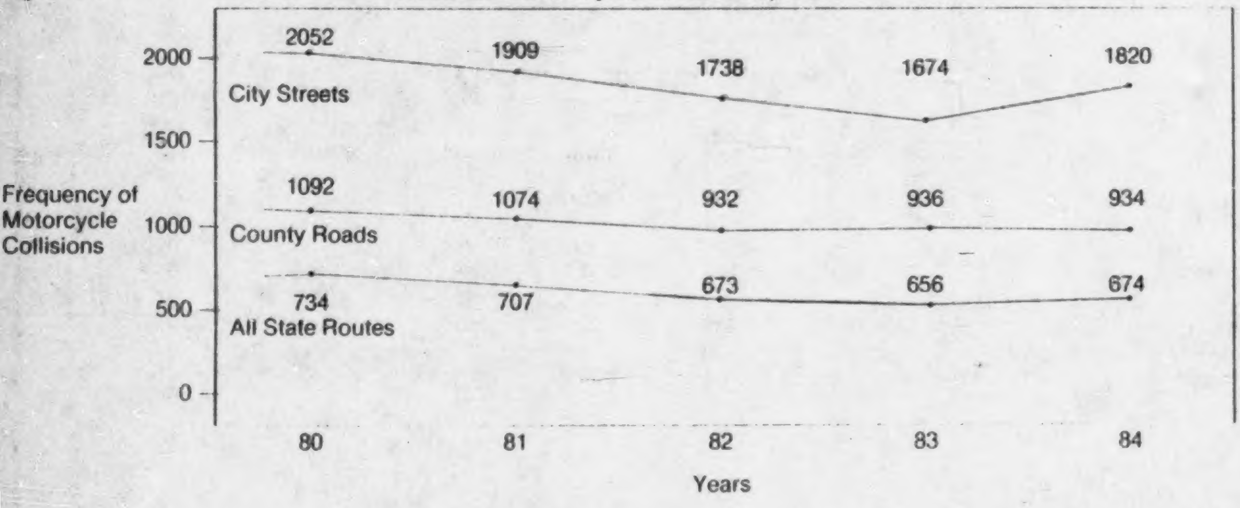
A further breakdown of 1984 motorcycle collisions by road type indicates that about 52.3% of the total collisions, 50.8% of the injury collisions and 33.3% of the fatal accidents occurred on city streets. About 27.8% of the injury collisions, 26.9% of the total collisions and 36.2% of the fatal collisions happened on county roads. State routes recorded 10.5% of the injury and 9.9% of the total collisions as well as 15.9% of the fatal motorcycle collisions (Table 5-3).

Table 5-3 **LOCATION OF MOTORCYCLE COLLISIONS — 1984**

Statewide Routes	Total Collisions	Fatal Collisions	Injury Collisions	P.D. Only Collisions	Motorcyclists Killed	Motorcyclists Injured
Interstate System	197	2	168	27	2	185
Other Full Control	54	0	47	7	0	53
U.S. Rt. No. (excluding city streets)	78	5	69	4	7	81
State Rt. No. (excluding city streets)	345	11	310	24	12	366
County Roads	934	25	823	86	27	995
City Streets (including U.S. and State Rt. in cities)	1,820	23	1,505	292	23	1,740
Other Traffic Ways	49	3	43	3	3	51
TOTAL	3,477	69	2,965	443	74	3,471

Total frequency of motorcycle collisions occuring on city streets and state highways increased during 1984 while county roads recorded a slight decrease. The increases on city streets and state routes follow a four-year decline (Figure 5-1).

Figure 5-1 **Location of Motorcycle Accidents By Year**



MOTORCYCLE COLLISIONS BY AGE GROUP

The 16-24 year old motorcycle rider continues to be over-represented in the accident population compared to the percentage of licensed motorcycle drivers comprising that age group. From age 25 on up, motorcycle riders continue to be under-represented (Table 5-4).

Table 5-4

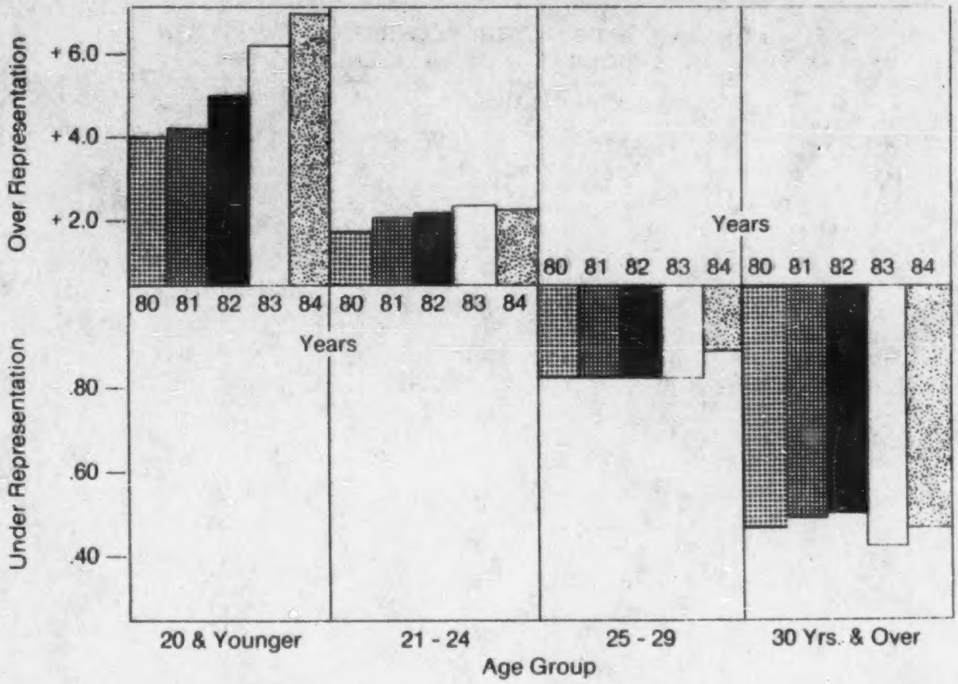
COMPARISON OF MOTORCYCLE RIDERS INVOLVED IN COLLISIONS TO NUMBER LICENSED IN 1984

	Motorcyclist Involved In:						**Percent of Licensed Drivers**	**Over/Under Representation**
	Fatal Collisions		**Injury Collisions**		**Total Collisions**			
	No.	**% of Total**	**No.**	**% of Total**	**No.**	**% of Total**		
Under 16	3	4.11%	73	2.48%	84	2.52%	—	—
16	0	—	79	2.69	83	2.49	0.10%	24.90
17-18	7	9.59	277	9.43	321	9.63	1.04	9.26
19-20	9	12.33	411	14.00	458	13.73	2.66	5.16
21-22	9	12.33	403	13.71	450	13.49	4.44	3.04
23-24	11	15.07	295	10.04	347	10.41	5.91	1.76
25-29	12	16.44	572	19.47	637	19.11	20.77	.92
30-34	6	8.22	329	11.20	377	11.31	21.91	.52
35-39	10	13.70	212	7.22	248	7.44	15.32	.48
40-44	1	1.37	105	3.57	121	3.63	9.78	.37
45-54	4	5.48	116	3.95	135	4.05	10.66	.38
55-64	1	1.37	51	1.74	55	1.65	5.40	.31
65 and over	0	—	15	0.51	18	0.54	2.01	.27

Figure 5-2 shows that motorcycle riders under 25 years of age, and particularly those 20 years old and younger, continue to be over-represented in total motorcycle accident involvement when compared to the percentages of licensed motorcycle riders comprising these age groups. The 25-29 year old and the 30 year old and over age group continue to be under-represented.

Figure 5-2

Comparison of Motorcycle Driver Over/Under Representation Collisions to Motorcycle Endorsement by Age Group 1980-1984



PRINCIPAL VIOLATIONS IN ACCIDENTS BY AGE GROUPS

Speed too fast for conditions was the principal cause of motorcycle collisions for all age groups in 1984, contributing to 22.5% of the year's motorcycle violations. Motorcyclists' driving while intoxicated was the second leading violation, contributing 10.7% to the violation total. Speed over the legal limit was the third most predominate violation, contributing 10.6% to the total of motorcycle driver violations (Table 5-5).

Table 5-5 **MOTORCYCLIST VIOLATIONS BY AGE — 1984**
(Investigated Collisions Only)

			AGE OF VIOLATOR							
Violation	**Total Viol.**	**% of Total**	**20 & Under**	**21 24**	**25 29**	**30 34**	**35 44**	**45 54**	**55 & Over**	**Not Stated**
Speed — Conditions	594	22.5	164	145	123	68	51	19	10	14
Speed — Over Legal	281	10.6	94	83	39	33	22	4	1	5
Failed to Yield	152	5.7	68	26	19	15	11	4	3	6
D.W.I.	283	10.7	40	84	59	50	38	7	1	4
Following Too Closely	143	5.4	48	28	28	13	12	7	5	2
Improper Passing	169	6.4	52	46	25	16	17	1	2	10
Operating Defective Equipment	145	5.5	55	30	20	16	13	8	2	1
Disregard Signs/ Signals	111	4.2	45	25	12	14	9	1	3	2
Over Centerline	74	2.8	21	25	8	5	11	2	1	1
Other Violations	693	26.2	223	162	116	59	66	31	16	20
TOTAL	2,645	100%	810	654	449	289	250	84	44	65

MOTORCYCLE COLLISIONS BY FIRST HARMFUL EVENT

In 1984 the most common first harmful event causing a single motorcycle collision was overturning. This cause predominated for all age groups. In multiple vehicle collisions involving motorcycles, the rear-end collision was most prevalent (14.3%). Angular collisions constituted the next most common event (14.2%) in multiple vehicle motorcycle collisions (Table 5-6).

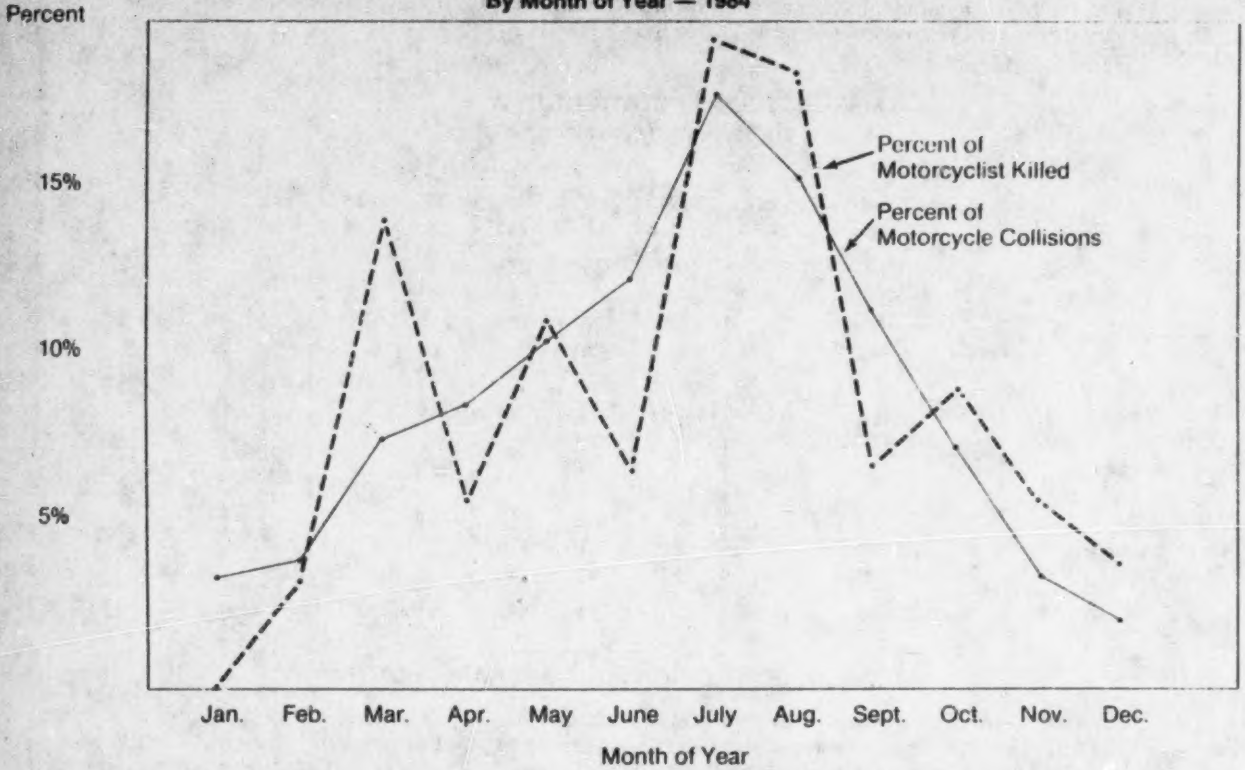
Table 5-6 **MOTORCYCLE COLLISIONS BY FIRST HARMFUL EVENT — 1984**

			Age of Motorcyclist						
Type of Collision (First Harmful Event)	**Total All**	**% of Total**	**20 & Under**	**21 24**	**25 29**	**30 34**	**35 44**	**45 54**	**55 & Over**
Single Motorcycle Coll:									
Struck Fixed Object	391	11.7%	111	105	76	37	40	14	8
Struck Other Object	12	0.4%	3	2	5	1	0	1	0
Overturned	798	23.9%	175	194	156	111	103	40	19
Motorcycle-Pedestrian	16	0.5%	7	2	2	2	3	0	0
Motorcycle-R.R. Train	0	—	0	0	0	0	0	0	0
Motorcycle-Pedalcyclist	16	0.5%	5	4	2	0	1	3	1
Motorcycle-Animal	65	1.9%	19	17	8	8	8	2	3
Non-Collision	41	1.2%	13	7	8	6	2	3	2
Total Single Motorcycle Coll's.	1,339	40.2%	333	331	257	165	157	63	33
Multiple Vehicle Coll:									
Head-on	38	1.1%	17	11	2	2	6	0	0
Rear-End	477	14.3%	133	123	89	49	48	23	12
Sideswipe	173	5.2%	43	47	31	21	20	8	3
Angular Direction	474	14.2%	142	100	97	60	47	16	12
Enter/Leave Driveway	454	13.6%	166	100	78	43	42	16	9
One Left/One Straight-Opp. Dir.	232	0.7%	57	59	50	26	34	5	1
Other Multiple Vehicle Coll.	147	4.4%	55	26	33	11	15	4	3
Total Multiple Vehicle Coll.	1,995	59.8%	613	466	380	212	212	72	40
TOTAL MOTORCYCLE COLL.	3,334	100.0%	946	797	637	377	369	135	73

TIME OF MOTORCYCLE ACCIDENT OCCURRENCE

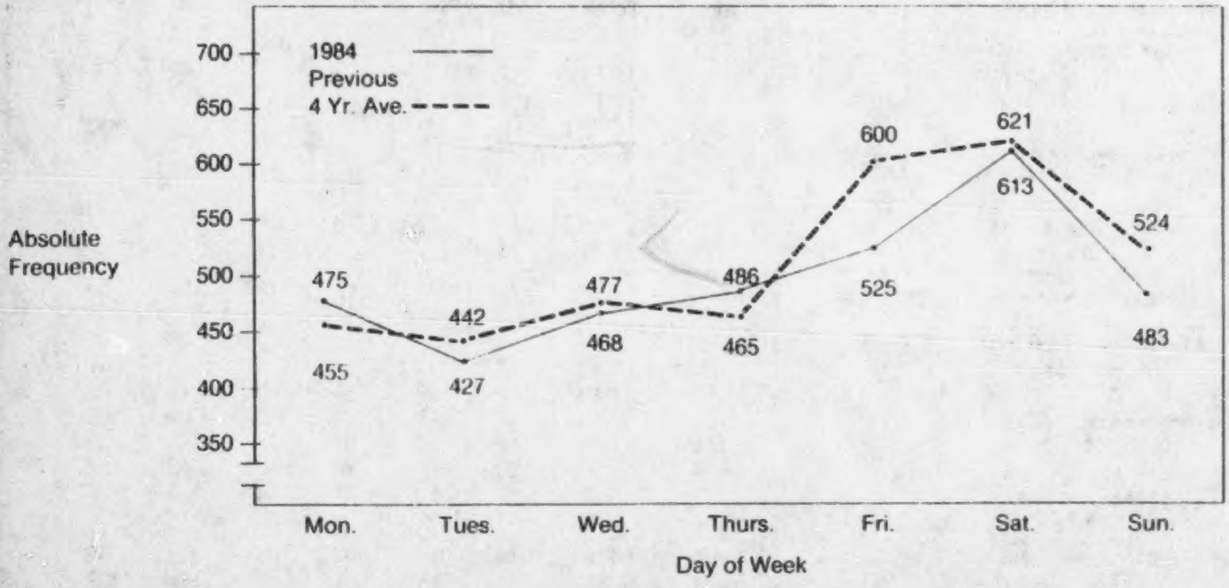
The warmer weather months (June-Sept.) of 1984 recorded the greatest percentages of motorcycle collisions and fatalities (Figure 5-3).

Figure 5-3 **Comparison of Motorcycle Collisions and Fatalities By Month of Year — 1984**



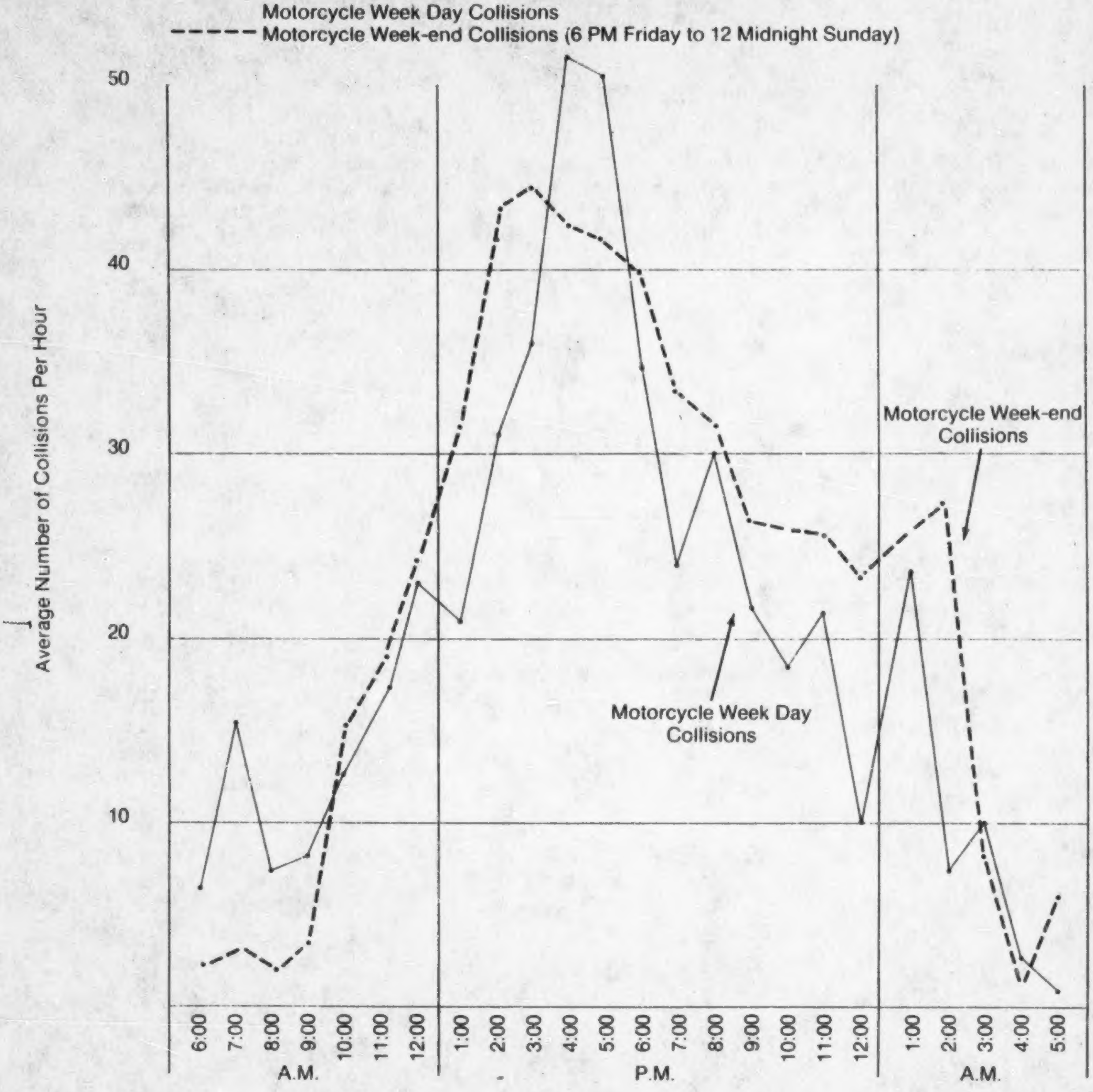
In comparing the frequencies of motorcycle collisions by day of week, Friday and Saturday are seen as the two days with the highest rate of occurrences. This trend has been consistent throughout the four-year baseline period and continued in 1984 as well. In 1984, total motorcycle collisions were down 3% from the average of the baseline period (Figure 5-4).

Figure 5-4 **Frequency of Motorcycle Collisions by Day of Week Over the Period 1984 & Previous 4 Year Ave.**



A further breakdown by hour of day when motorcycle collisions were occurring in 1984 reveals that the weekday hours from 1 p.m. to 7 p.m. constituted the most dangerous period of the day. The same 1 p.m. to 7 p.m. time frame also proved to be a dangerous time of day for weekend motorcycling. However, the average number of collisions per hour involving motorcycles on weekends continued to climb sharply from 9 a.m. to a 3 p.m. peak, unrelieved by the drop between noon and 1 p.m. evidenced on weekdays (Figure 5-5).

Figure 5-5 **Average Number of Motorcycle Collisions by Hour of Day on Weekdays, Weekends and Weeklong in 1984**



PEDALCYCLES

Overview

In 1984 total pedalcycle accidents increased 5.1% over the previous four-year average. The number of pedalcyclists killed dropped 15.4% from the baseline period. The number of persons injured was up 5.5% (Table 6-1).

Table 6-1

PEDALCYCLE TRAFFIC COLLISIONS
1980 — 1984

	1980	1981	1982	1983	Previous 4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
Total Collisions	1,097	1,083	1,056	1,230	1,117	1,174	+ 5.1%
Persons Killed	11	20	8	14	13	11	- 15.4%
Persons Injured	1,125	1,094	1,078	1,266	1,141	1,204	+ 5.5%

RURAL — URBAN PEDALCYCLE ACCIDENTS

Total pedalcycle collisions in 1984 were up 8.3% in rural areas and up 3.6% in urban areas compared to a 4-year baseline period. The number of persons killed in rural areas in 1984 was 8 , down one from the baseline, while 3 persons died in urban pedalcycle collisions, also down one from the average of the previous 4 years. Rural injuries from pedalcycle collisions were up 9.2% in 1984 over baseline while urban injuries in this regard were up 3.8% (Table 6-2).

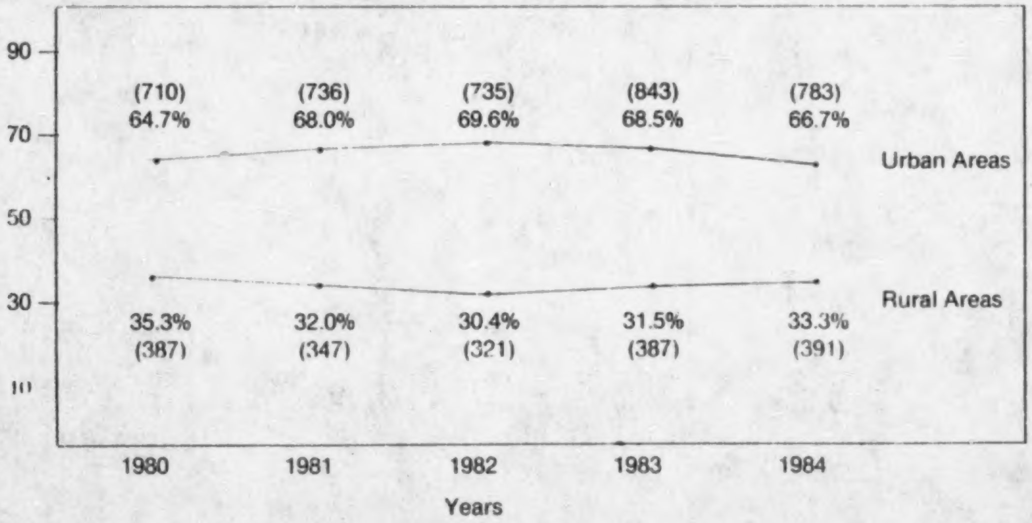
Table 6-2

RURAL — URBAN PEDALCYCLE ACCIDENTS

Rural Areas	1980	1981	1982	1983	Previous 4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
Total Collisions	387	347	321	387	361	391	+ 8.3%
Persons Killed	9	14	4	10	9	8	- 11.1%
Persons Injured	395	353	335	401	371	405	+ 9.2%
Urban Areas							
Total Collisions	710	736	735	843	756	783	+ 3.6%
Persons Killed	2	6	4	4	4	3	- 25.0%
Persons Injured	730	741	743	865	770	799	+ 3.8%

In 1984, 66.7% of the pedalcycle collisions occurred in urban areas, continuing a downward trend from 1982's high of 69.6%. Rural areas experienced a slight increase to 33.3% in 1984, up from the 30.4% low point in 1982 and the 31.5% occurring in 1983 (Figure 6-1).

Figure 6-1 Pedalcycle Collisions by Urban/Rural Locations



PEDALCYCLISTS KILLED AND INJURED — BY AGE

In 1984, 27.2% of the pedalcyclists killed were in the 35-44 age bracket. The 10-14 age group experienced the largest number of injuries, 30.6% of the total. The number of pedalcyclists killed in 1984 fell by 15% from the 4-year average while injuries rose 4.5% (Table 6-3).

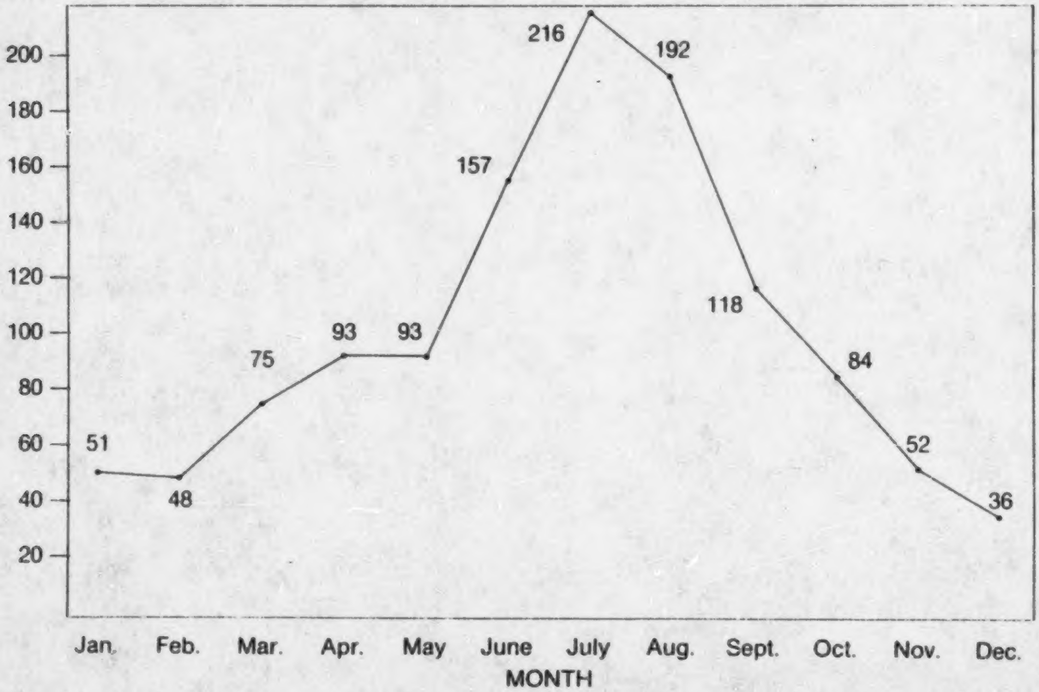
Table 6-3 AGE OF PEDALCYCLIST KILLED AND INJURED — 1980 - 1984

	Killed							Injured						
Age	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change
0 to 4	0	2	1	1	1	0	- 100%	21	14	16	21	18	19	+ 5.6%
5 to 9	2	4	1	1	2	1	- 50%	217	180	160	180	184	171	- 7.1%
10 to 14	5	2	1	5	3	2	- 33%	365	306	331	404	352	359	+ 2.0%
15 to 19	2	5	1	4	3	1	- 67%	203	201	197	240	210	240	+ 14.3%
20 to 24	1	4	0	2	2	0	- 100%	119	124	103	113	115	122	+ 6.1%
25 to 34	1	0	1	0	1	0	- 100%	97	118	126	139	120	147	+ 22.5%
35 to 44	0	1	0	0	0	3	+ 100%	26	43	31	47	37	35	- 5.4%
45 to 54	0	0	1	0	0	0	0	10	13	15	11	12	17	+ 41.7%
55 to 64	0	1	1	0	1	1	N/C	4	12	7	11	9	8	- 11.1%
65 to 74	0	1	1	1	1	2	+ 100%	7	5	4	4	5	11	+ 120.0%
75 and Older	0	0	0	0	0	1	+ 100%	3	3	2	4	3	2	- 33.3%
Not Stated	0	0	0	0	0	0	0	53	60	56	63	58	41	- 29.3%
Total	11	20	8	14	13	11	- 15%	1,125	1,079	1,048	1,237	1,122	1,172	+ 4.5%

PEDALCYCLE FATAL AND INJURY ACCIDENTS — BY MONTH

The warm weather months of June through September accounted for more than half of all injury and fatal pedalcycle accidents in 1984. This four-month period contained slightly more than 56% of the year's total injuries and deaths (Figure 6-2).

Figure 6-2 **Persons Killed and Injured In Pedalcycle Collisions — By Month**



The city of Olympia experienced the highest pedalcycle collision rate in the state during 1984 with 97.3 collisions per 100,000 population. Olympia also had the highest pedalcyclist injury rate at 97.3 per 100,000. Wenatchee recorded the second highest collision rate in the state at 75 collisions per 100,000 population. Wenatchee's injury rate also was second highest at 69.2 injuries per 100,000 (Figure 6-3).

Figure 6-3

Pedalcycle Collision Rate By Population
Cities 15,000 Population and Greater
1984

Population		Pedalcycle Deaths	Death *Rate	Pedalcycle Injuries	Injury *Rate	Total Pedalcycle Collisions	Collision *Rate
250,000 and Over							
Seattle	490,300	2	.41	199	40.6	194	39.6
100,000 to 250,000							
Spokane	171,500	0	0	88	51.3	87	50.7
Tacoma	159,400	0	0	66	41.4	69	43.3
50,000 to 100,000							
Bellevue	78,620	0	0	43	54.7	42	53.4
Everett	56,680	0	0	26	45.9	24	42.3
25,000 to 50,000							
Yakima	49,340	0	0	20	40.6	21	42.6
Bellingham	46,010	0	0	28	60.9	28	60.9
Vancouver	42,850	0	0	19	44.3	19	44.3
Kennewick	37,240	0	0	6	16.1	6	16.1
Bremerton	33,970	0	0	20	58.9	20	58.9
Renton	33,340	0	0	9	27.0	8	24.0
Richland	31,660	0	0	8	25.3	9	28.4
Longview	29,820	0	0	17	57.0	17	57.0
Auburn	29,170	0	0	11	37.7	9	30.9
Olympia	28,790	0	0	28	97.3	28	97.3
Edmonds	27,880	0	0	9	32.3	9	32.3
Redmond	27,340	0	0	8	29.3	8	29.3
Walla Walla	26,250	0	0	14	53.3	14	53.3
Kent	25,640	0	0	9	35.1	9	35.1
15,000 to 25,000							
Lynnwood	23,139	0	0	8	34.6	8	34.6
Pullman	22,770	0	0	6	26.4	6	26.4
Mercer Is.	20,910	0	0	3	14.3	3	14.3
Pasco	18,930	0	0	3	15.8	3	15.8
Kirkland	18,670	1	5.36	6	32.2	7	37.6
Puyallup	18,600	0	0	3	16.1	3	16.1
Aberdeen	17,400	0	0	6	34.5	6	34.5
Wenatchee	17,330	0	0	12	69.2	13	75.0
Pt. Angeles	17,220	0	0	3	17.4	3	17.4
Mt. Lk. Terr.	16,020	0	0	6	37.5	6	37.5

*Frequency per 100,000

PEDESTRIANS

Overview

The 97 pedestrians killed in 1984 were 7.6% fewer than the 4-year average. The 1,710 pedestrians injured were 2.4% below the 4-year baseline (Table 7-1).

Table 7-1

PEDESTRIANS KILLED AND INJURED 1980 — 1984
STATEWIDE — URBAN AND RURAL

	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
Pedestrians Killed	108	121	101	89	105	97	- 7.6%
Pedestrians Injured	1906	1696	1705	1701	1752	1710	- 2.4%

LOCATIONS AND AGE GROUPS OF PEDESTRIAN ACCIDENTS

In 1984 pedestrian fatalities in rural areas decreased 10.5% from the previous 4-year average while injuries declined 9.1%. Urban area pedestrian fatalities in 1984 declined 4.2% from baseline with injuries showing a slight 0.2% increase (Table 7-2).

Table 7-2

	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
RURAL AREAS							
Pedestrian Killed	58	69	55	44	57	51	-10.5%
Pedestrian Injured	551	457	496	471	494	449	- 9.1%
URBAN AREAS (2,500 population and greater)							
Pedestrians Killed	50	52	46	45	48	46	- 4.2%
Pedestrians Injured	1355	1239	1209	1230	1258	1261	+ 0.2%

PEDESTRIANS KILLED AND INJURED — BY AGE

In 1984 pedestrians 75 years old and above experienced a 23.5% decline in number of fatalities from the previous 4-year average. This age group likewise saw a 13.0% decline from baseline in the number of pedestrian injuries. The largest number of pedestrians killed in 1984 was 18 in the 25-34 year age bracket. This age group also experienced the highest number of pedestrian injuries (255) for the year (Table 7-3).

Table 7-3

AGE OF PEDESTRIANS KILLED AND INJURED — 1980 - 1984

	Killed							Injured						
Age	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change
0 to 4	5	6	5	4	5	8	+ 60.0%	86	75	79	84	81	75	- 7.4%
5 to 9	5	9	6	6	7	6	- 14.3%	256	246	225	216	236	215	- 8.9%
10 to 14	4	6	6	4	5	8	+ 60.0%	217	209	209	216	213	194	- 8.9%
15 to 19	7	14	8	13	11	6	- 45.5%	238	180	219	209	212	215	+ 1.4%
20 to 24	11	12	9	6	10	9	- 10.0%	168	155	174	163	165	167	+ 1.2%
25 to 34	16	18	15	12	15	18	+ 20.0%	270	253	235	222	245	255	+ 4.1%
35 to 44	11	8	9	10	10	8	- 20.0%	132	130	129	124	129	126	- 2.3%
45 to 54	9	13	2	5	7	4	- 42.9%	121	84	69	97	93	121	+ 30.1%
55 to 64	7	9	11	8	9	11	+ 22.2%	97	75	89	89	88	89	+ 1.1%
65 to 74	10	10	13	8	10	6	- 40.0%	99	92	61	90	86	89	+ 3.5%
75 and Older	22	16	17	13	17	13	- 23.5%	85	91	103	89	92	80	- 13.0%
Not Stated	1	0	0	0	0	0	0	137	106	113	102	115	84	- 27.0%
Total	108	121	101	89	102	97	- 4.9%	1,906	1,696	1,705	1,701	1,752	1,710	+ 2.5%

ACTIONS OF PEDESTRIANS KILLED AND INJURED
1984 — RURAL AND URBAN AREAS

The most frequently injured or killed pedestrian in rural areas in 1984 fell into the 15-24 year old age bracket. The most common action of this group leading to the accidents was "not in roadway." The next most common accident-contributing action by the group was crossing "not at intersection" (Table 7-4).

Table 7-4

RURAL AREAS	No. Killed	% of Total	Total Killed or Inj.	% of Total	Age 0-4	Age 5-14	Age 15-24	Age 25-64	Age 65 & Up	Not Stated
Crossing, entering roadway at intersection	5	9.8%	92	18.4%	1	24	25	26	12	4
Not at intersection	22	43.1%	170	33.9%	15	71	35	35	12	2
Walking with traffic	5	9.8%	32	6.4%	0	4	15	7	5	1
Walking against traffic	1	2.0%	8	1.6%	0	2	4	2	0	0
Standing or working in roadway	4	7.8%	36	7.2%	1	1	9	21	2	2
Playing in roadway	1	2.0%	8	1.6%	1	4	0	1	0	2
Lying in roadway	2	3.9%	3	0.6%	0	0	1	2	0	0
Not in roadway	8	15.7%	107	21.4%	2	18	46	32	3	6
Other & Not Stated	3	5.9%	45	9.0%	0	7	15	17	0	6
TOTAL	51	100.0%	501	100.0%	20	131	150	143	34	23
Percent of Total Killed or Injured					4.0%	26.1%	29.9%	28.5%	6.8%	4.6%

ACTIONS OF PEDESTRIANS KILLED & INJURED — 1984

In urban areas in 1984, the most frequently involved pedestrian in fatal and injury accidents fell into the 25-64 year old age group, which accounted for 37.3% of all pedestrians killed or injured in traffic accidents. The most common contributing action of this age group was "crossing, entering roadway at intersection" (Table 7-5).

Table 7-5

URBAN AREAS	No. Killed	% of Total	Total Killed or Inj.	% of Total	Age 0-4	Age 5-14	Age 15-24	Age 25-64	Age 65 & Up	Not Stated
Crossing, entering roadway at intersection	15	32.6%	636	48.5%	11	107	110	267	108	33
Not at intersection	19	41.3%	396	30.2%	35	150	65	103	29	14
Walking with traffic	2	4.3%	19	1.5%	0	3	5	8	2	1
Walking against traffic	1	2.2%	9	0.6%	0	1	2	3	1	2
Standing or working in roadway	1	2.2%	67	5.1%	4	1	20	36	2	4
Playing in roadway	1	2.2%	14	1.0%	6	4	0	0	0	0
Lying in roadway	2	4.3%	4	0.3%	1	0	1	2	0	0
Not in roadway	3	6.5%	92	7.0%	2	11	23	44	8	4
Other & Not Stated	2	4.3%	73	5.6%	4	15	18	26	5	5
TOTAL	46	100.0%	1,310	100.0%	63	292	248	489	155	63
Percent of Total Killed or Injured					4.8%	22.3%	18.9%	37.3%	11.8%	4.8%

PEDESTRIAN ACCIDENTS
BY DAY OF WEEK AND HOUR OF DAY

In 1984 the highest one-day percentages of weekly total and fatal accidents involving pedestrians (18.8% and 22.6% respectively) were recorded for Friday (Figure 7-1). The 3 p.m. to 6 p.m. time period evidenced the greatest percentages of both fatal and total pedestrian collisions at 24.7% and 30.2%, respectively (Figure 7-2).

Figure 7-1 **Total and Fatal Pedestrian Collisions by Day of Week — 1984**

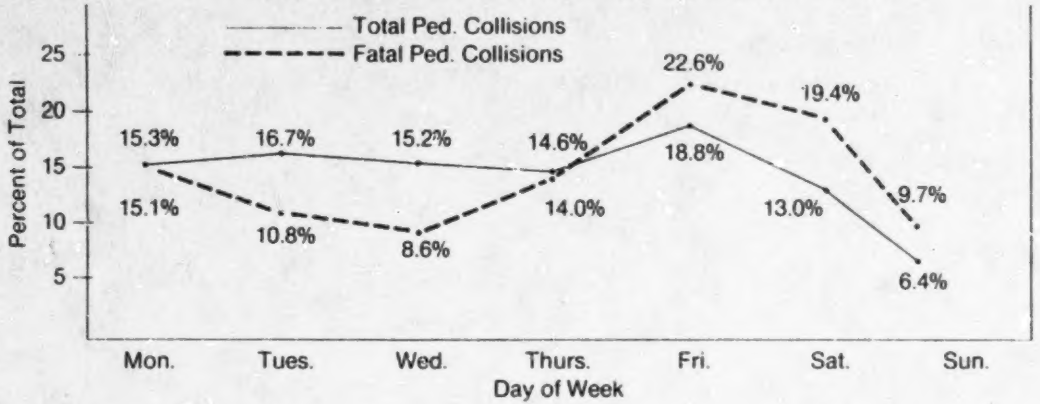


Figure 7-2 **Total and Fatal Pedestrian Collisions by Hour of Day — 1984**

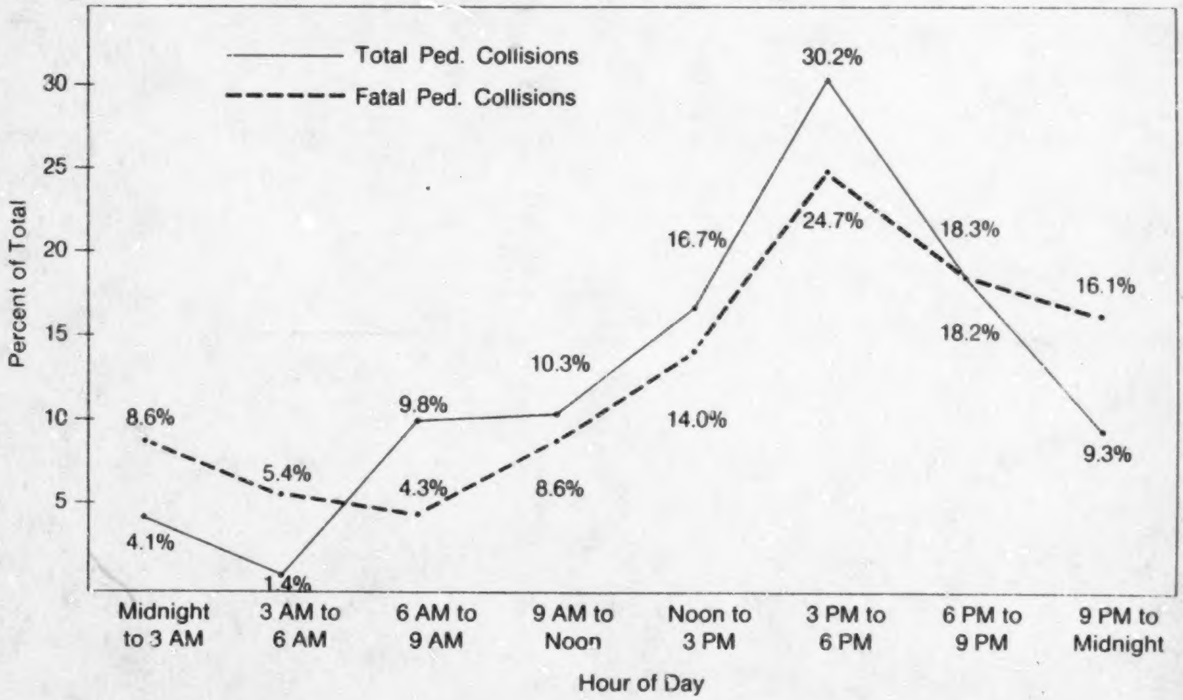


Figure 7-5 below presents the 1984 number and rates for pedestrian traffic deaths, injuries, and total collisions for cities of 15,000 or more in Washington. Seattle had the greatest number of fatalities, but Vancouver had the greatest rate of pedestrian fatalities at 7 per 100,000 population. Seattle had the greatest number of pedestrian collisions and pedestrian injuries as well as the highest rate for total pedestrian collisions (95.7 per 100,000) and pedestrian injuries (103.4 per 100,000).

Figure 7-5

Pedestrian Collision Rate By Population
Cities 15,000 Population and Greater
1984

Population		Pedestrian Deaths	Death *Rate	Pedestrian Injuries	Injury *Rate	Total Pedestrian Collisions	Collision *Rate
250,000 and Over Population							
Seattle	490,300	17	3.47	507	103.4	469	95.7
100,000 to 250,000 Population							
Spokane	171,500	5	2.92	123	71.72	108	63.0
Tacoma	159,400	5	3.14	99	62.11	99	62.11
50,000 to 100,000 Population							
Bellevue	78,670	1	1.27	32	40.68	32	40.68
Everett	56,680	2	3.53	42	74.10	38	67.04
25,000 to 50,000 Population							
Yakima	49,340	1	2.03	38	77.02	35	70.94
Bellingham	46,010	2	4.35	19	41.30	18	39.12
Vancouver	42,850	3	7.00	35	81.68	31	72.35
Kennewick	37,240	0	-0-	3	8.06	3	8.06
Bremerton	33,970	0	-0-	32	94.20	31	91.26
Renton	33,340	0	-0-	18	53.99	15	44.99
Richland	31,660	0	-0-	7	22.11	6	18.95
Longview	29,820	1	3.35	15	50.30	16	53.66
Auburn	29,170	0	-0-	14	47.99	14	47.99
Olympia	28,790	0	-0-	18	62.52	18	62.52
Edmonds	27,880	0	-0-	9	32.28	8	28.69
Redmond	27,340	1	3.66	9	32.92	10	36.58
Walla Walla	26,250	0	-0-	9	34.29	7	26.67
Kent	25,640	0	-0-	9	35.10	8	31.20
15,000 to 25,000 Population							
Lynnwood	23,139	0	-0-	13	56.18	11	47.54
Pullman	22,770	0	-0-	7	30.74	7	30.74
Mercer Is.	20,910	0	-0-	3	14.35	2	9.56
Pasco	18,930	1	5.28	8	42.26	9	47.54
Kirkland	18,610	0	-0-	6	32.24	5	26.87
Puyallup	18,600	1	5.38	12	64.52	9	48.39
Aberdeen	17,400	0	-0-	8	45.98	8	45.98
Wenatchee	17,330	0	-0-	5	28.85	5	28.85
Pt. Angeles	17,220	0	-0-	11	63.88	8	46.46
Mt Lk Terr	16,020	0	0	9	56.18	8	49.94

*Frequency per 100,000 population

HEAVY TRUCKS

Overview

In 1984, 7,472 heavy trucks were involved in collisions, for a 16.6% increase over the four-year baseline. Registrations in 1984 totaled 150,661, a 6.8% increase over the four-year average. Based on this registration figure, the 1984 collision rate was 495.9 collisions per 10,000 registered trucks, an increase of 9.2% over the previous four-year average.

There were 87 heavy trucks involved in fatal collisions during 1984. This was a 4.8% increase over the baseline average. The fatal collision rate of 5.8 collisions per 10,000 registered trucks was a slight decrease from the baseline period (Table 8-1).

Table 8-1 SUMMARY OF HEAVY TRUCKS
10,000 GROSS VEHICLE WEIGHT (GVW) AND GREATER INVOLVED IN TRAFFIC COLLISIONS

	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
Total Trucks Involved in Collisions*	7,164	6,122	5,822	6,525	6,408	7,472	+16.6%
Trucks Involved in Fatal Collisions	108	97	63	65	83	87	+ 4.8%
Registration of Heavy Trucks**	136,669	141,042	141,225	145,595	141,133	150,661	+ 6.8%

COLLISIONS PER 10,000 REGISTERED TRUCKS

RATES:	1980	1981	1982	1983	4 Yr. Avg.	1984	% of Change 1984 to 4 Yr. Avg.
Total Collision Rate	524.2	434.1	412.2	448.2	454.0	495.9	+ 9.2%
Fatal Collision Rate	7.9	6.9	4.5	4.5	5.9	5.8	- 0.3%

*Minimum damage for a reportable collision $300 to the property of any one person
**Estimated

LOCATION OF HEAVY TRUCK COLLISIONS BY SEVERITY

In 1984, 54% of the heavy trucks involved in total collisions were in urban areas (Figure 8-1). In 1984 there were 18 heavy trucks involved in fatal accidents in urban areas, compared to 69 in the rural areas. These figures comprise a 20.7 - 79.3% urban/rural proportion of involvement in fatal accidents, (Figure 8-2). The 1984 heavy truck involvement in injury accidents was split, 1,068 urban to 1,173 rural. These figures are a 47 - 53% urban/rural split (Figure 8-3).

Figure 8-1 Heavy Truck Collision Involvement by Urban/Rural Location

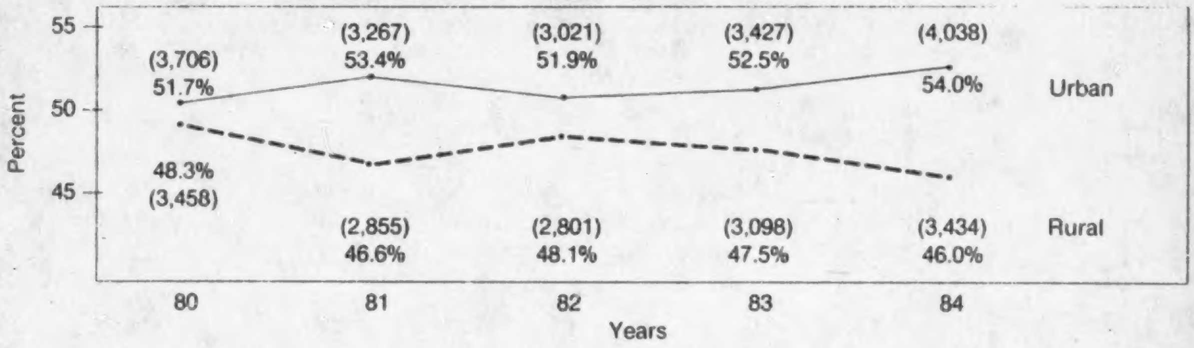


Figure 8-2 **Heavy Trucks Involved In Fatal Collisions by Urban/Rural Location**

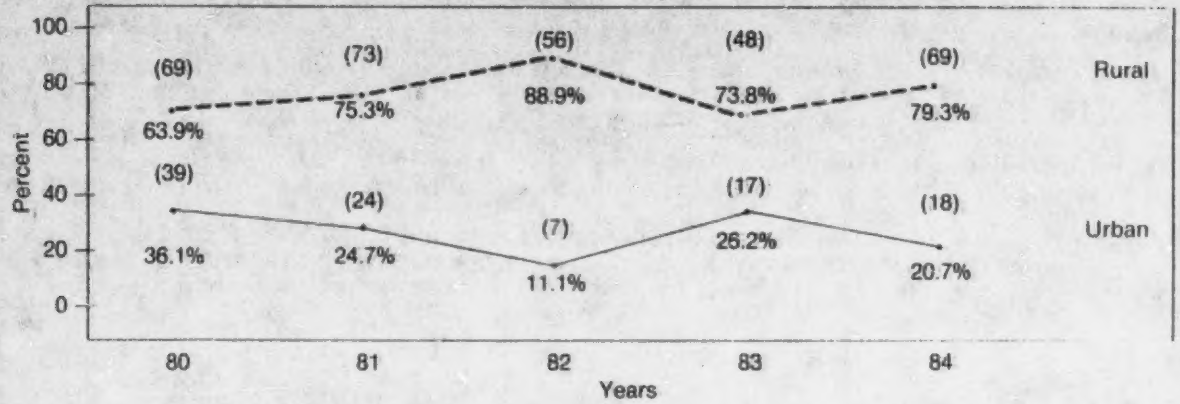
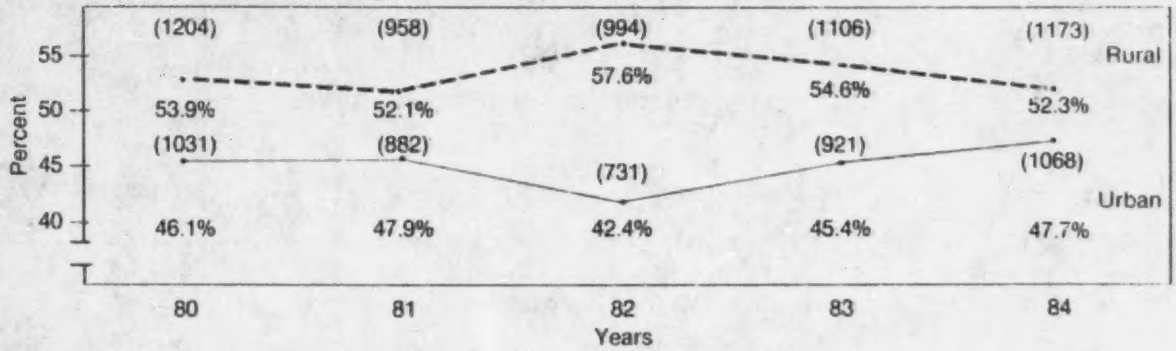


Figure 8-3 **Heavy Truck Injury Involvement by Urban/Rural Location**



AGE OF DRIVERS INVOLVED IN HEAVY TRUCK COLLISIONS IN 1984

The 19-year old and under and 20-29 year old age groups were the only two age groups to be over-represented in heavy truck collisions in 1984 compared to the percentage of licensed drivers each group comprised. The 19 and under group comprised 1.1% of all licensed heavy truck operators. Yet, this group was involved in 3.2% of all heavy truck accidents, 1.3% of the fatal accidents and 3.4% of the heavy truck injury accidents. The ratio for percent of accident involvement compared to percent of licensed drivers comprised by the 19 and under age group resulted in an over-representation ratio of 2.90 for this group. The 20-29 year old age group was involved in 31.4% of the total collisions, 31.6% of the fatal collisions and 31.9% of the injury collisions. This group comprised 17.9% of all drivers having a classified endorsement on their licenses. Based on the percent of licensed drivers and accident involvement, this group was over-represented in accidents by a ratio of 1.75. The rest of the driver age groups are under-represented in total accidents (Table 8-2).

Table 8-2

Age	All Accidents Frequency	%	Fatal Accidents Frequency	%	Injury Accidents Frequency	%	*Percent of Classified End. Drivers	**Over/Under representation
19 & Under	205	3.2	1	1.3	67	3.4	1.1%	2.90
20-29	2,008	31.4	25	31.6	631	31.9	17.9%	1.75
30-39	1,941	30.4	19	24.1	592	29.9	33.2%	.92
40-49	1,230	19.2	24	30.4	379	19.2	22.7%	.85
50-59	773	12.1	9	11.4	234	11.8	14.4%	.84
60 & Over	238	3.7	1	1.3	75	3.8	10.7%	.35

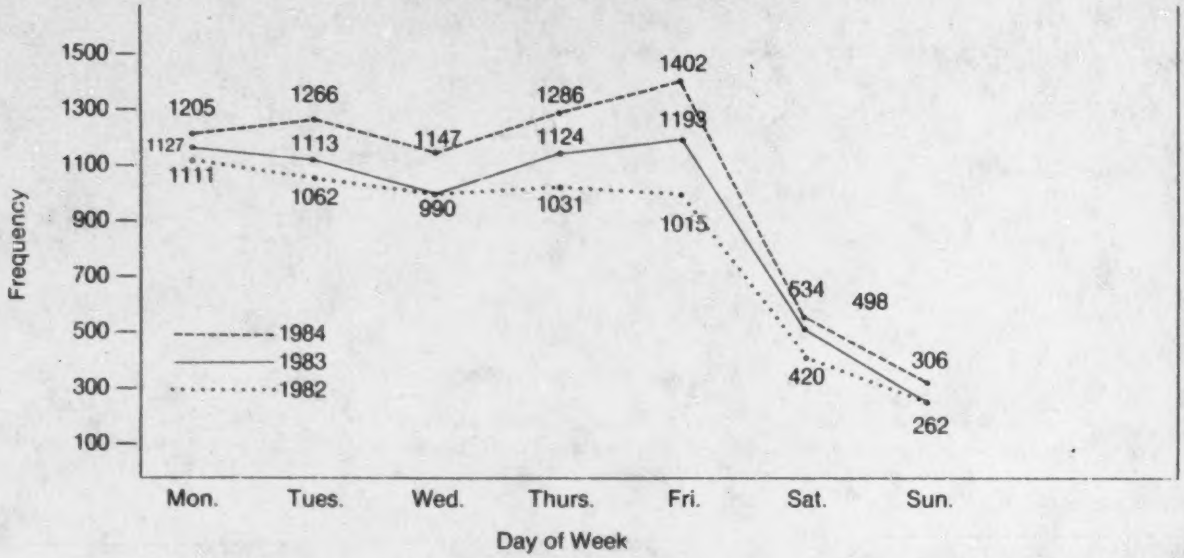
*Classified Endorsement is only required for operators of the larger trucks and truck combinations
**Percent of collision involvement to percent of licensed drivers

HEAVY TRUCK ACCIDENT OCCURRENCES BY TIME

The daily frequency of heavy truck accidents in 1984 exceeded those occurrences of the two previous years while following about the same frequency pattern. The weekdays had the highest frequencies of heavy truck collision involvement. During the weekends, there was a substantial decline in the frequency of heavy truck involvement in collisions (Figure 8-4).

Figure 8-4

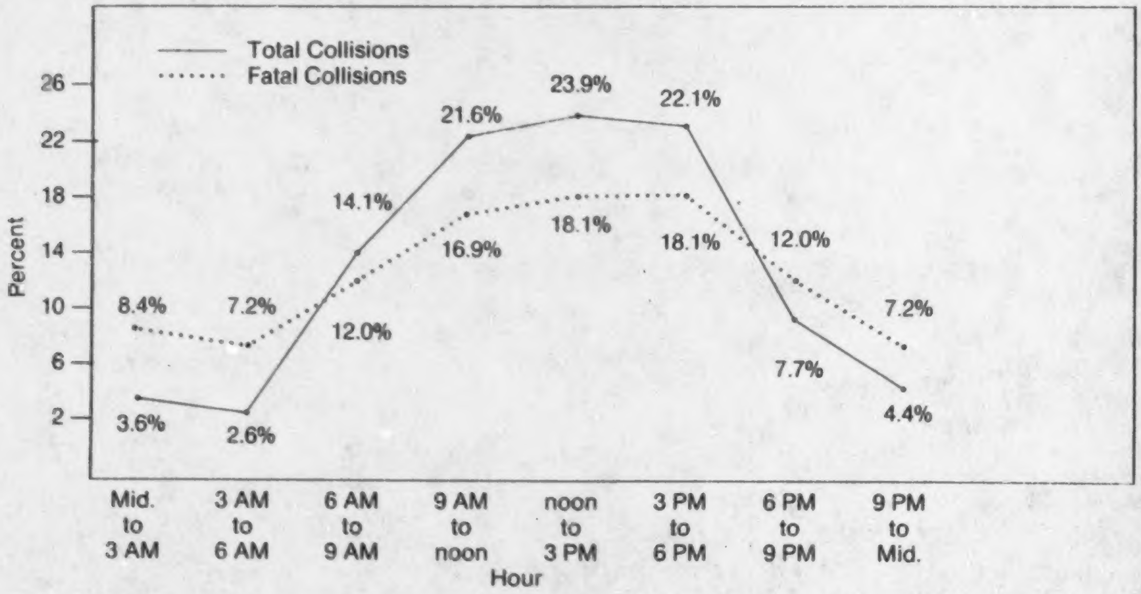
Heavy Truck Involvement in Total Collisions by Day of Week for 1982 - 1984



In 1984 the time period from noon to 3 PM recorded the highest incidence of heavy truck involvement in collisions. A substantial increase in collisions commenced during the 3 AM to 6 AM time period, peaking at the noon to 3 PM period and then commencing to decline (Figure 8-5).

Figure 8-5

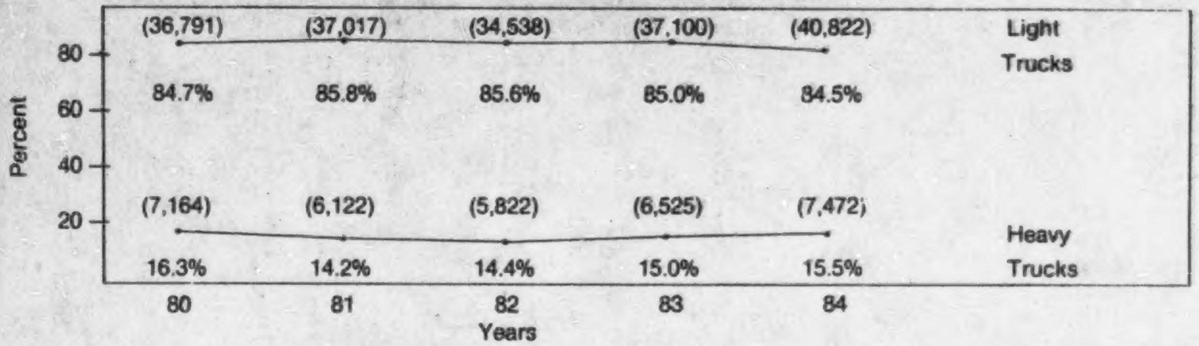
Heavy Truck Involvement in Total and Fatal Collisions by Hour of Day — 1984



TOTAL COLLISIONS — LIGHT TRUCKS vs. HEAVY TRUCKS

In 1984 there were 40,822 light trucks and 7,472 heavy trucks involved in collisions. This 84.5% - 15.5% ratio between light and heavy trucks represents only a slight change from the ratios of the previous three years (Figure 8-6).

Figure 8-6 Light & Heavy Truck Involvement in Total Collisions 1980 - 1984



COLLISIONS BY FIRST HARMFUL EVENT

During 1984 heavy trucks were involved in 5,170 collisions involving other moving motor vehicles. This figure represents 72.5% of all heavy truck collisions. Heavy trucks also were involved in 507 collisions in which the other vehicle was parked and in 801 collisions with fixed or other objects. Overturning, other non-collisions and all other collisions accounted for the remaining heavy truck-involved collisions (Table 8-3).

Table 8-3 HEAVY TRUCK COLLISIONS BY FIRST HARMFUL EVENT — 1981, 1982, 1983 & 1984

	1981		1982		1983		1984	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Collision with other moving motor vehicle	4,224	71.7	3,984	71.2	4,577	72.6	5,170	72.5
Collision with parked motor vehicle	468	7.9	422	7.5	409	6.5	507	7.1
Collision with fixed or other object	648	11.0	646	11.5	689	10.9	801	11.2
Overturning	317	5.4	331	5.9	394	6.2	409	5.7
Other non-collision	134	2.3	135	2.4	145	2.3	139	1.9
All other collisions/Pedestrian, Pedalcyclist, etc.	100	1.7	81	1.5	93	1.5	117	1.6

HEAVY TRUCK DEFECTS

In 1984 defective brakes accounted for 44.1% of the defects detected in heavy trucks involved in collsions. Other defects and the percentages were worn or smooth tires, 11.4%; defective rear lights, 7.5%; defective steering, 3.4%, and all other defects, 28.4% (Table 8-4).

Table 8-4 DEFECTS OF HEAVY TRUCKS INVOLVED IN COLLISIONS — 1981, 1982, 1983 & 1984

	1981		1982		1983		1984	
Condition of Vehicle	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Defective Brakes	202	40.3	185	36.4	228	40.0	359	44.1
Defective Headlights	4	0.8	2	0.4	5	0.9	6	0.7
Defective Rear Lights	37	7.4	46	9.1	44	7.7	61	7.5
Defective Steering Mechanism	22	4.1	20	3.9	23	4.0	28	3.4
Puncture or Blowout	28	5.6	31	6.1	38	6.7	37	4.5
Worn or Smooth Tires	84	16.8	70	13.8	94	16.5	93	11.4
Other Defects	124	24.8	154	30.3	195	34.2	231	28.4

*Based on 5,866 trucks involved in total investigated collisions.

PUPIL TRANSPORTATION

Overview

In the 1983-1984 school year there were 248 reported school bus collisions in which 142 persons were injured. This represented a 13.6% decrease over the previous 3-year average in total school bus collisions and an 18.4% decrease in the number of persons injured. There were 6,005 registered school buses in the 1983-1984 school year. This marked a 2.4% decrease in registrations from the 3-year baseline period. (Table 9-1).

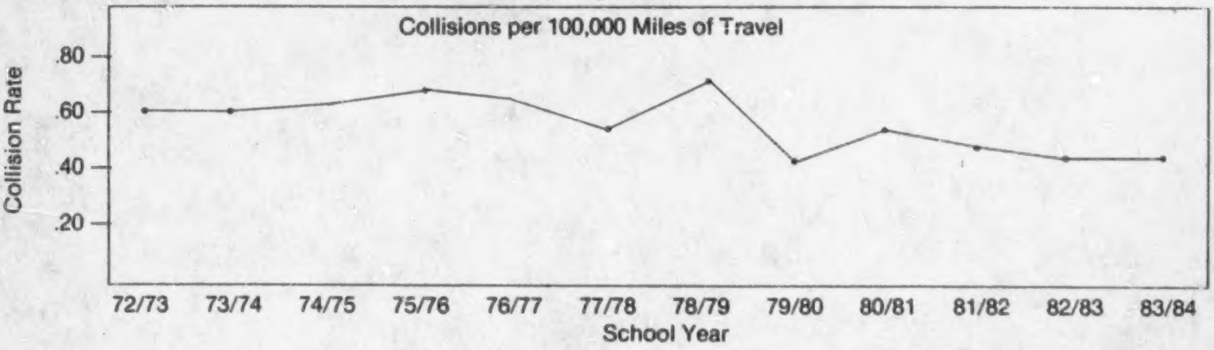
Table 9-1 FOUR YEAR COMPARISON OF COLLISIONS INVOLVING SCHOOL BUSES
1980/1981 — 1983/1984

	School Year					Percent of Change '83-84 to 3 Yr. Avg.
	1980 1981	1981 1982	1982 1983	Prev. 3 Yr. Average	1983 1984	
Total Collisions	324	281	256	287	248	- 13.6%
Fatal Collisions	1	2	2	2	0	-100.0%
Number Killed	1	2	2	2	0	-100.0%
Injury Collisions	112	90	85	96	75	- 21.9%
Persons Injured						
Pupils	80	44	57	60	50	- 16.7%
School Bus Drivers	14	16	12	14	11	- 21.4%
Other Occupants of School Bus	0	0	1	1	4	+300.0%
Pedestrian/Bicyclist	9	2	2	4	6	+ 50.0%
Occupants of Other Vehicles Involved	98	93	94	95	71	- 25.3%
Total Injured	201	155	166	174	142	- 18.4%
Property Damage Only Collisions	211	189	169	190	173	- 8.9%
School Bus Registration	6,052	6,127	6,286	6,155	6,005	- 2.4%
*Registration Collision Rate	53.5	45.9	40.7	46.6	41.3	- 11.4%
Miles Traveled (In Thousands)	57,471.8	58,619.5	64,713.1	60,268.1	61,042.7	+ 1.3%
**Mileage Collision Rate	.56	.48	.40	.48	.41	- 14.6%

*Collisions per 1,000 registered vehicles
**Collisions per 100,000 miles of travel

In 1983-1984 school year, the school bus mileage collision rate was .41 collisions per 100,000 miles of travel (Figure 9-1). This rate was up from the 1982-83 rate of .40 and the .48 rate of the previous 3-year baseline (Figure 9-1).

Figure 9-1 COMPARISON OF SCHOOL BUS MILEAGE COLLISION RATE
72/73 to 83/84 School Year

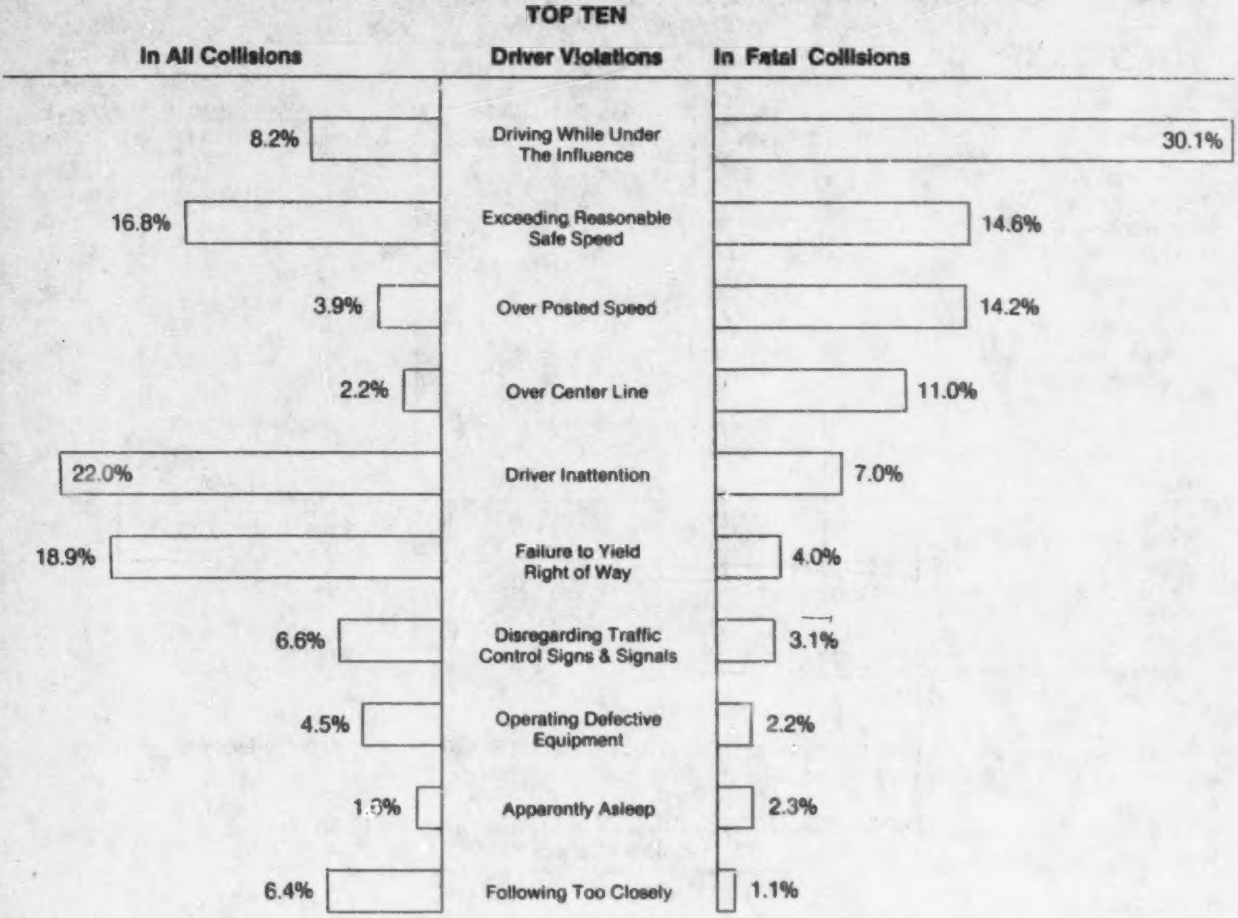


CONTRIBUTORY DRIVER VIOLATIONS

Overview

Driving while under the influence of intoxicating liquor contributed to 30.1% of the driver violations in fatal collisions and 8.2% of all investigated collisions. Driver inattention contributed to 22% of all investigated collisions and 7% of the violations in fatal collisions (Figure 10-1).

Figure 10-1



VEHICLE DEFECTS

Overview

In investigated collisions during 1984, only 5.2% of the accident-involved vehicles were found to have contributory vehicle defects. The most common defect was worn or smooth tires, a defect found in 2,996 vehicles. This represented a 1.4% decrease in this category compared to the previous 4-year average. Defective brakes, the second most contributory defect, was found on 1,785 collision-involved vehicles in 1984. This was an increase of 18.5% compared to the baseline (Table 10-1).

Table 10-1

VEHICLE CONDITION
(In Investigated Collisions Only)

	1980	1981	1982	1983	4 Yr. Avg.	1984	Percent of Change 1984 to 4 Yr. Avg.
Defective Tires:							
Worn or Smooth Tires	3,302	3,054	2,828	2,964	3,037	2,996	- 1.4%
Puncture or Blowout	683	557	446	462	537	367	- 31.7%
Defective Brakes	1,543	1,585	1,383	1,514	1,506	1,785	+ 18.5%
Defective Lights:							
Headlights	220	184	150	149	176	143	- 18.8%
Rear Lights	482	403	394	361	410	394	- 3.9%
Other Lights/Reflectors	122	117	95	95	107	122	+ 14.0%
Defective Steering	360	334	281	308	321	381	+ 18.7%
All Other Defects	1,316	1,080	1,145	1,387	1,232	1,439	+ 16.8%
No Defects	135,008	136,592	123,345	131,273	131,555	139,320	+ 5.9%
Total Vehicles Involved	143,036	144,082	130,067	138,513	138,881	146,947	+ 5.8%